IN THIS ISSUE

STEEL The Metalworking Weekly

August 5, 1957
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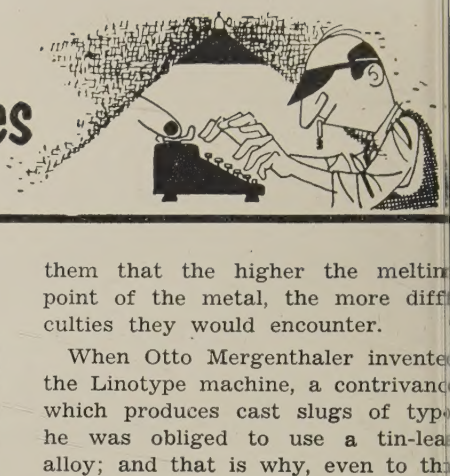
behind the scenes



Marketing Men Marked

On page 66, STEEL examines a situation that rates more than a flash of attention: The shortage of marketing personnel. Seems as how this situation came about because production has caught up with demand. Industry, as of 10:20 a.m., Aug. 5, 1957, finally appears to have almost enough engineers, but now it is worried about the occurrence of qualified marketing personnel.

Because a successful economy rests on so many varied efforts, it would be fatuous to declare that merchandising alone is the key to profits. However, if you discount the effects of sound marketing, you might just as well prepare to close up shop. You can't make money without devoting a whole lot of attention toward sales.

We know of one man who didn't give a hoot about profits. His name was Crates, and he used to live in Thebes almost four centuries before some money-changers were driven from a temple in Jerusalem. He feared that the quiet of philosophical pursuits would be disturbed by the cares of wealth, so he threw all his money into the sea. This old boy was loaded, too, the story goes, and when he jettisoned all that moola, it made a respectable splash. It's comforting to know that he became quite a philosopher, but that kind of philosopher modern industry can do without; unless, of course, the cabbage he drops happens to be occupation zlotys.

Light on Diecasting

The castings you saw on the cover a moment ago were diecast. They are aluminum alloy, and represent a trend that has been going on since—let's see—well, since the Middle Ages, when talented craftsmen made iron molds, or dies, into which they poured pewter. Diecasting was found to be superior to sand or plaster casting in that the molds didn't have to be destroyed to recover the product; but just when the inventors began shaking hands with themselves, somebody (possibly a smart apprentice) reminded them that the higher the melting point of the metal, the more difficulties they would encounter.

When Otto Mergenthaler invented the Linotype machine, a contrivance which produces cast slugs of type he was obliged to use a tin-lead alloy; and that is why, even to this day, when the most golden phrases are set in print they are reduced to lead.

Diecasting has risen in importance since the war. In 1800, toy manufacturers poured lead into two-part iron molds, and rejoiced that the 619°F melting point didn't harm the molds. Today, diecasting machines produce as many as 50 castings per hour, and their owners rejoice that the dies are strong enough to withstand 1600°F. That would be the melting point of brasses or copper-zinc alloys.

What is the future of diecasting? What are its limitations? How can you exploit its many advantages? Frankly, friends, we haven't the vaguest idea. But if you *want* to know, turn at once to page 89.

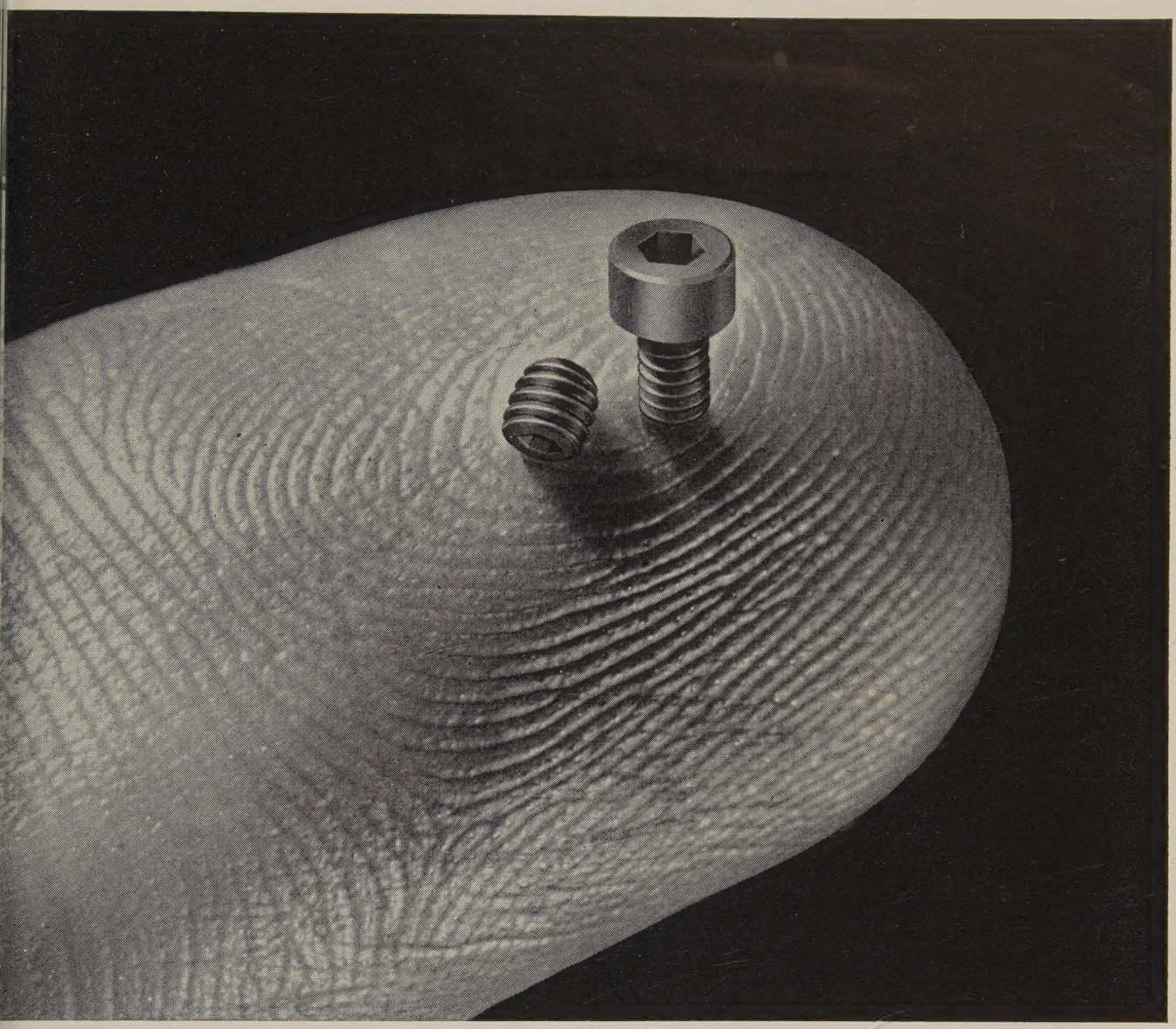
J DWNNQ VWNU

The small but faithful band of puzzle-worker-outers who gravitate to this corner of page 6, regardless of the weather, are entitled to a rest from some of the rougher forms of mathematics that sometimes appear here. Most of it is a mystery to us, anyway. Here, for a change, is a cryptoquip, together with a cryptic cipher. We selected a sentence at random from a recent issue of STEEL (so we couldn't be accused of inventing something out of the ordinary) and kicked the letters and ciphers all around. As the item stands now, if a K is an A, it is an A throughout; if a 3 is a 6, it is always a 6. Ready? Here we go:

VA 6400 KYJSG OGYX. XVWWDEHYTF, EHVQW 667 EJYTND JAK 1 WGMEGJWD; VA 6401, 651 JAK 68. 6402'D EJOZQGT GR GYKNYD VAOQHKNL YNLHNDWD RGY 69 KGOZD.

Shrdlu

(Metalworking Outlook—Page 49)



Cleveland miniature socket screws give extra strength in compact assemblies

Cleveland miniature cap and set screws eliminate the need for designing special screws to fasten parts in compact units. In countless intricate devices — servomechanisms, computers, typewriters, electronic and electrical equipment—they are used as functional parts permitting significant reduction in size, weight and cost without sacrificing strength.

Dimensions are held to very close tolerances. Accurately formed hexagon sockets insure high torque, nonslip wrenching, and maximum wrench holding power. Threads are rolled for accurate Class 3 fit and to gain extra fatigue and tensile strength. Alloy steel screws are carefully heat treated to obtain optimum of 180,000 psi minimum tensile strength.

Cleveland standard miniature screws are available from stock in both high quality heat treated alloy steel and nonmagnetic 18-8 stainless. Write today for prices and a copy of the Cleveland socket screw products folder.

RECOMMENDED INSTALLATION TORQUES IN IN.-LB. FOR HEAT TREATED ALLOY STEEL SOCKET SCREWS

Socket head cap screws			Socket set screws, plain cup point		
Diameter	NC	NF	Diameter	NC	NF
#0	—	2.0	#0	0.5	0.5
#1	3.5	3.5	#1	1.5	1.5
#2	6.0	6.0	#2	1.5	1.5
#3	8.5	9.5	#3	5.0	5.0

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LETTERS TO THE EDITORS

Company To Study Plan

We believe the article, "How To Ai Your Engineers" (July 15, page 64) contains excellent material and a pla worth investigating for application i our rapidly expanding engineering de partment.

Please send two copies for our engi neering staff to study.

W. E. Patterso
Engineering Departmer
Pfaudler Co
Elyria, O

Direct Aid to Work

The excellent two-part article, "Hov To Avoid Trouble with Stainless Welds (June 24, page 116, and July 1, pag 70), provided information of direct in terest in our work.

We would appreciate three copies t fulfill the requirements of our weldin departments at our Dayton, O., an Buffalo, N. Y., plants.

Walter A. Luc
Duriron Co. Inc
Dayton, O

New Frontier To Explore

Please send six copies of your ex cellent Program for Management article "Research . . . Threshold to the Future" (July 15, page 93). I found it most in teresting—full of meat—and would like to pass these copies on to others who will be interested.

C. M. Marberg
Director of Research
Inland Steel Container Co.
Chicago

Old, But Still Marvelous

A problem came up the other day involving an SAE spec, an equivalent ASTM spec and a federal spec. We were almost at a loss on how to solve it because we didn't have time for the usual type of investigation required.

I went to the superintendent of the shop, a man of 40 years or more experience, and told him of the problem. He smiled, reached into his desk and pulled out the most amazing, the most incredibly fantastic and profoundly magnificent publication that I have ever seen in my ten years of experience.

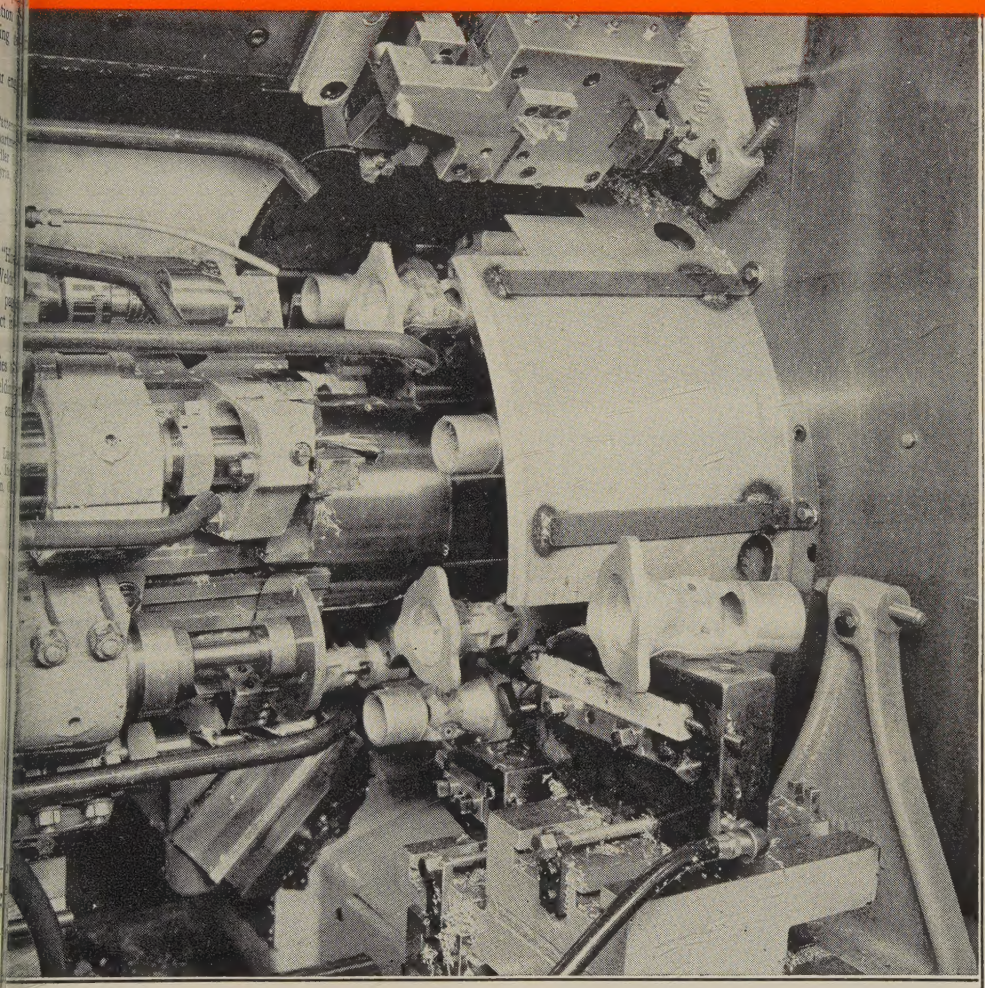
It was a copy of STEEL's *Specification Handbook* (January, 1953). With it, it took us no longer than a minute to solve the problem. I knew at once that such a publication would be of infinite value to me and our key engineers.

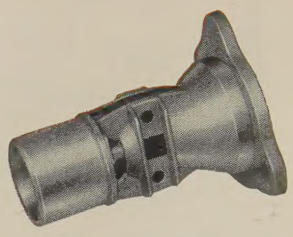
I realize, of course, that since this incredible handbook was published out

(Please turn to page 12)

Acme-Gridley

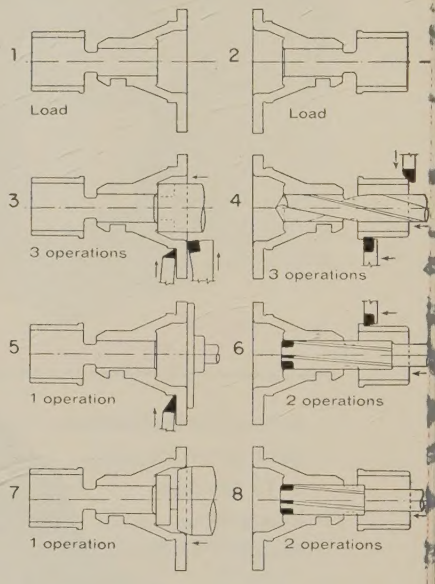
RPA-8 SPINDLE CHUCKER



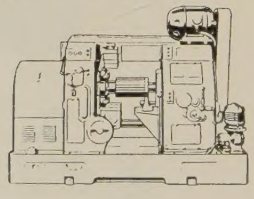


BASKET HUB
ALUMINUM DIE CASTING

Double indexing—both ends completed at one setup on 6" RPA-8 Acme-Gridley Chucking Automatic.



12 operations in 13 seconds



SPEEDS PRODUCTION . . .

eliminates special machine investment

When it became necessary to replace the special machine on which this washing machine basket hub had been produced, the production engineer chose an Acme-Gridley eight spindle chucker. His choice was based on two factors: lower initial investment than that required by the special machine; greater adaptability of the Acme-Gridley with proper tooling to handle many such jobs that otherwise would require special equipment.

Acme-Gridley 8-spindle automatic chucking machines give you maximum production at lowest cost per piece because of greater tooling flexibility, double indexing that permits finishing both ends of the piece at one time, and comprehensive tooling engineering that comes only from COMPLETE LINE experience.

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Bulletin Nos. CM-44 and CM-51A

INDEX . . . to lower machining costs . . .

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LETTERS

(Concluded from page 10)

of problems arising in World War II it may be difficult for you to comply with my request for a copy. However if you are able somehow to supply about ten of these handbooks for my key men and me, not only will you be helping me immeasurably, but also the Navy department as well.

Irwin B. Spandau
Chief Design Co-ordinator
Marine & Mechanical Engineering Department
Design Division
New York Naval Shipyard
Brooklyn, N.Y.

• *Our supply of* STEEL's Specification Handbook *is exhausted, but we have contrived to come up with one copy which we are sending for your personal use. For the others, we suggest you obtain copies of the Supply and Logistics Handbook—Standardization H 1-A,* Cross Index of Chemically Equivalent Specifications and Identification Codes *at the nearest branch of the U.S. Department of Commerce, or write to the office of the Assistant Secretary of Defense, Supply & Logistics, Washington 25, D.C. This is essentially the same as our handbook, but more current.*

Inflation Cuts Dollar Value

Please send a copy of the informative article, "Is Wage Inflation at Fault?" (June 17, page 64).

Of course, the extent of enlightenment on the part of the individual reader will depend upon the degree to which he will infer certain important economic relationships.

E. L. Recchion
Standards Engineering Section
Betts Atomic Power Division
Westinghouse Electric Corp.
Pittsburgh, Pa.

Old Method Up to New Tricks

In your July 8 issue, you had an interesting article, "Rolls Forge Precision Parts" (page 97). I would appreciate two copies.

R. H. Mangle
Section Supervisor
Factory Engineering
Tapco Division
Thompson Products Inc.
Danville, Pa.

Read this article with interest and would like eight copies.

H. R. Potter
District Manager
Carpenter Steel Co.
Cleveland

Tool to Sales Force

Your article, "Managing Our Markets" (June 17, page 93), impressed us as an advantageous communication tool to our local sales force. Please forward 75 copies.

Robert Oberhausen
Crucible Steel Co. of America
Chicago

Article Aids Chemical Engineer

Kindly send a copy of the article, "Atmosphere Control" (Part I, May 20, page 138, and Part II, May 27, page 96). I am a chemical engineer and have been working for the U.S. Army in Japan for 11 years. This story will help me a great deal.

J. Mizuno
Shinzyuku-ku
Tokyo, Japan

CALENDAR
OF MEETINGS

Aug. 5-6, National Screw Machine Products Association. National sales conference, Moraine hotel, Highland Park, Ill. Association's address: 2860 E. 130th St., Cleveland 20, O. Executive vice president: Orrin B. Werntz.

Aug. 12-15, Society of Automotive Engineers: West coast meeting, Olympic hotel, Seattle. Society's address: 485 Lexington Ave., New York 17, N.Y. Secretary: John A. C. Warner.

Aug. 20-23, Western Electronic Show & Convention: Cow Palace, San Francisco. Information: WESCON, 342 N. LaBrea, Los Angeles 36, Calif.

Aug. 28-30, American Institute of Electrical Engineers: Pacific general meeting, Chinook hotel, Yakima, Wash. Institute's address: 33 W. 39th St., New York 18, N.Y. Secretary: N. S. Hibshman.

Sept. 8-11, National Metal Trades Association: Eastern plant management conference, Essex-Sussex hotel, Spring Lake, N.J. Association's address: 337 W. Madison St., Chicago 6, Ill. Secretary: Charles L. Blatchford.

Sept. 9-11, American Mining Congress: Metals mining and industrial minerals convention, Utah and Newhouse hotels, Salt Lake City, Utah. Congress' address: 1102 Ring Bldg., Washington 6, D.C. Executive vice president and secretary: Julian D. Conover.

Sept. 9-12, Society of Automotive Engineers: Tractor meeting and production forum, Hotel Schroeder, Milwaukee. Society's address: 485 Lexington Ave., New York 17, N.Y. Secretary: John A. C. Warner.

Sept. 9-13, Instrument Society of America: Annual instrument - automation conference and exhibit, Public Auditorium, Cleveland. Society's address: 313 Sixth Ave., Pittsburgh 22, Pa. Executive director: William H. Kushnick.

Sept. 12-14, Automotive Parts Rebuilders Association: Annual meeting and exhibit, Congress hotel, Chicago. Association's address: 220 S. State St., Chicago 4, Ill. Executive secretary: Jack O'Sullivan.

Sept. 17-18, Radio-Electronics-Television Manufacturers Association: National technical machine tool automation meeting, Ambassador hotel, Los Angeles, Calif. Association's address: 1721 DeSales St. N.W., Washington 6, D.C. Secretary: James D. Secrest.

Sept. 17-20, American Die Casting Institute: Annual meeting, Edgewater Beach hotel, Chicago. Institute's address: 366 Madison Ave., New York 17, N.Y. Secretary: David Laine.

Sept. 18-20, National Industrial Conference Board: Marketing meeting, Waldorf-Astoria hotel, New York. Board's address: 460 Park Ave., New York 22, N.Y. Secretary: Herbert S. Briggs.

Sept. 21-24, Steel Founders' Society of America: Fall meeting, Homestead, Hot Springs, Va. Society's address: 606 Terminal Tower, Cleveland 13, O. Secretary: George K. Dreher.

Sept. 22-24, American Machine Tool Distributors Association: Annual meeting, Hotel Cleveland, Cleveland. Association's address: 1900 Arch St., Philadelphia 3, Pa. General manager: James C. Kelly.

Sept. 22-25, American Institute of Wholesale Plumbing & Heating Supply Association Inc.: Annual meeting, Waldorf-Astoria hotel, New York. Institute's address: 402 Albee Bldg., Washington 5, D. C. Executive secretary: George T. Underwood.

READ THIS AND...

YOU BE THE JUDGE

OF THE IMPORTANCE OF SPECIFYING

LYNCHBURG FOUNDRY

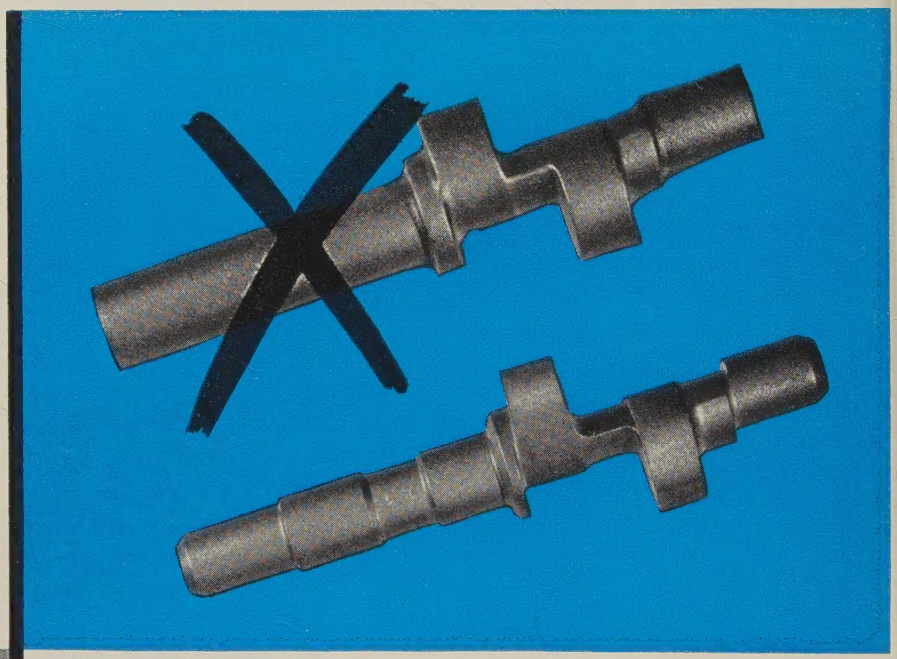
SHELL CASTINGS

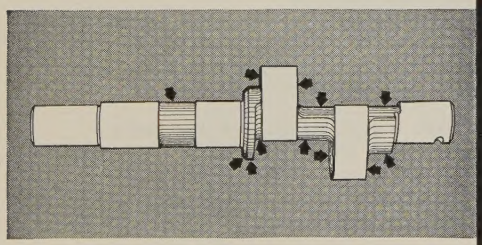
GREATER UNIFORMITY—A must with today's high-speed automatic machine tools—it means less fixturing time, lower machine shop losses, and less balancing when required.

LESS MACHINING—Close control of dimensions means less machining, faster machining methods, or in some instances elimination of machining altogether.

MADE FOR LIGHT TRAVEL—Less machine stock means reduced weight—lowering transportation costs both in shipment and within the factory.

SUPERIOR SURFACE FINISH—Shell castings have "eye appeal"—their surface dresses up any finished product. Further, a smooth finish reduces wear on machine tools.





No machining is required on the surfaces indicated by arrows when this refrigeration crankshaft is shell molded.

Exhibit A in the case for shell molding is this refrigeration crankshaft. It may look like a relatively simple piece but machining it was a chore. For every one of the various surfaces a different machining operation had to be performed. Shell molding's smooth finish and close dimensional accuracy meant that a total of twelve (count 'em in the diagram at the left) surfaces could be used as cast. That's twelve time-consuming and costly machining operations eliminated.

Consider, too, the extra stock that had to be machined off when the shell molding process was not used. The original crankshaft before machining weighed 3.5 pounds while the shell molded crankshaft weighs but 2.5 pounds—a tremendous saving in transportation costs when you consider large quantities!

You be the judge. A number of different types of crankshafts are being shell molded in both gray and ductile iron at Lynchburg Foundry. Your verdict? Why not specify Lynchburg Foundry Shell Castings.

GRAY IRON AND DUCTILE IRON—

Heat treated or as cast

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Metalworking Outlook

Shift to Missiles Helps IT&T

International Telephone & Telegraph Co.'s four main defense divisions see continued high sales in 1958 as a result of the Air Force shift from manned aircraft to missiles . . . Slowdowns in manned aircraft procurement continue. Latest victims: McDonnell Aircraft Corp.'s F101; Lockheed Aircraft Corp.'s F104; Convair's F106; and Republic Aviation Corp.'s F105 . . . A missile maker is also feeling the pinch. North American Aviation Inc. reports it had $126 million in unfilled orders for the Navaho guided missile on June 30. Much of the work has been canceled, but J. H. Kindelberger, chairman, North American, says the current fiscal year will be the best in the firm's history. The outlook for '58 is "less favorable."

Blough Sees Improvement

U.S. Steel Corp.'s chairman, Roger M. Blough, predicts that the steel industry in the second half will operate at 80 to 85 per cent of ingot capacity, and that production for the year will approximate 115 million tons. He believes that consumer inventories reached their peak late in the second quarter, but ascribes little of it to buying in anticipation of higher prices in July. Those stocks, he thinks, will be reduced in the current half, with consumption exceeding output. Orders will tend upward, with an anticipated boost from autos late in the third quarter.

Birth of a New Industry?

Radioisotope prices may drop drastically. The Atomic Energy Commission is building a pilot plant at Oak Ridge, Tenn., to mass produce "hot" atoms from atomic reactor waste. Says the AEC: "The economic feasibility of private enterprise participation in radioisotope production appears imminent."

Communities by the Package?

Hotpoint Co. teamed up with a Texas construction firm, a railroad and a public utility to form practically a complete community in Illinois. Hotpoint purchased 770 acres and plans to start construction on its first plant this fall. The Texas firm has a 6000-home development under way —all homes to be fully equipped with Hotpoint appliances—and has set aside another 720 acres for industrial development. The Chicago & Northwestern Railroad has spurs to the area and will construct a marshaling yard for industry. Commonwealth Edison Co. is taking care of the power needs. The entire project involves about 3000 acres, principally farm land, about 20 miles northwest of Chicago.

More Pattern Bargaining

Examples: Mechanics Educational Society of America (MESA) won't let any of its locals sign contracts for more than one year. United Steel-

workers held a national meeting early this summer and plans regional conclaves to sell the basic steel pattern to its 1500 locals that have contracts with companies other than basic steel. United Auto Workers and International Association of Machinists have met to draft pattern demands to be made to the aircraft industry where both unions represent employees. More developments of this sort will come as the AFL-CIO gains strength and locals lose more and more autonomy.

NLRB Has Busy Quarter

During the second quarter, 3750 cases were filed with the National Labor Relations Board, the largest number since the third quarter of 1953. AFL-CIO unions participated in 1272 collective bargaining elections, won 751 of them. Independent unions participated in 162, won 110 of them.

IUE Restive at GE

The International Union of Electricalworkers is making noises that indicate it may try to open its contract with General Electric Co. in 1958 even though it's supposed to run until 1960. The contract does contain a reopener clause for a discussion of employment security next year, which the IUE may try to use as a foot in the door to bargain on wages. The Westinghouse Electric Corp. contract has a similar provision.

UAW and Retirement

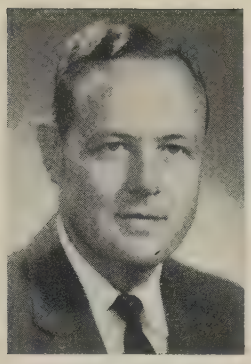
Part of UAW members' dues are going into a fund for a long range program for older and retired members. About $28,000 a month is being contributed to a program that aims at providing educational and pre-retirement counseling plans for workers approaching retirement and at providing "drop in" centers for retired members. Three such centers already operate in Detroit.

New Look at Manpower

Plagued by inadequate—and sometimes conflicting—figures on the nation's technological manpower needs, the President's Committee on Scientists & Engineers will sponsor a "hard look" at available statistics. To do the job will be researchers headed by Phillip M. Hauser, University of Chicago.

Straws in the Wind

Preliminary figures in a nationwide test indicate the average year-round cost for heating and cooling a residence is $10.64 a month . . . Bid prices for federal aid highway construction in the second quarter were 0.1 per cent higher than they were in the first . . . Major atomic energy contracts performed by Blaw-Knox Co. through its Chemical Plants Division have totaled about $450 million since 1947 . . . H. K. Porter Company Inc. forms its eleventh division with acquisition of Cleveland Hardware & Forging Co. . . . Beryllium Corp. last week unveiled a $4.5 million plant at Hazleton, Pa., which will supply 500,000 lb of pure beryllium to the Atomic Energy Commission over a five-year period (Brush Beryllium Co., Cleveland, will supply another 500,000 lb).



Needed: Better Marketing

The future success of your business will depend on the kind of a marketing job you do in the next few years. The signposts all point in that direction.

The business population (contractors, manufacturers, wholesalers, retailers and service firms) has been increasing at a rate of 50,000 a year. The total stood at 4.3 million at the beginning of the year.

Yet in an expanding market for goods, the number of firms in manufacturing has been declining. Since 1952, failures have exceeded new incorporations by 20,000. On Jan. 1, there were 307,000 manufacturers in business—and some have fallen by the wayside in the last seven months.

A study of each casualty undoubtedly would reveal weaknesses in one or more of the five main functions of a business: Product design, manufacturing methods, financing, personnel management and marketing.

In many cases, marketing would be at the top of the list.

Since the war, the emphasis in industry has centered on production and its attendant problems. Practically anything from raw materials to finished products found eager takers. Slipshod, lackadaisical selling got by.

In the last few months, there has been a noticeable switch in emphasis from the science of production to the science of marketing.

We call it a science since selling no longer is simply a matter of hiring a salesman and sending him out to pick up an order. It involves product planning, market research, advertising and sales promotion, sales training and effective channels of distribution. In brief, it means the orientation of your business to your customer.

Such a program may call for the eventual expansion of your marketing staff, which may present a problem because a shortage of marketing personnel is taking shape (see page 66). But we think the first question is: Are you making full use of what you have?

Take the advertising manager, for example. He is a key "contact" man for all your present and potential customers. But in too many companies he is underrated, underpaid and understaffed. We think that if you make a realistic analysis of his function, you will upgrade his position on the marketing ladder and do your company a lot of good in the process.

Irwin H. Such
EDITOR-IN-CHIEF

What's the lowest cost way to produce steel parts like these?

You may be paying considerably more than you need to for parts like these if you aren't taking advantage of Ryerson flame-cutting service.

Size makes no difference—nor intricacy of shape. You can order one part or one thousand and get quick delivery of steel cut to close tolerance—with almost die-cut accuracy from piece to piece. And here's where the saving comes in:

1. **No dies or molds** are needed so you save this cost when you switch from cast or forged parts to flame-cut parts.
2. **Less machining** is usually required to finish a flame-cut part. Sometimes machining is eliminated altogether.
3. **Freight costs lower**—If you're now paying freight on steel you later scrap you may well be able to pay for flame cutting with the money you save by shipping lighter flame-cut parts. The blank for a 6″ disc is 49% heavier than the disc itself. Storage and handling expenses are reduced, too.
4. **Less time in process**—You can often convert finished products into cash more quickly because parts can be produced faster by flame cutting.
5. **No loss on spoilage or rejects**—They're our problem—not yours.
6. **Design changes are simpler** and can be made more frequently without sacrificing manufacturing economy.

You draw on the nation's largest steel stocks at Ryerson—and unequalled flame-cutting facilities are ready to work for you. A blue print or sketch with clearly marked dimensions is all we need for prompt handling of your requirements. Call your nearby Ryerson plant for cost-cutting flame-cut steel today.

In stock: Carbon, alloy and stainless steel—bars, structurals, plates, sheets and strip, tubing, re-bars—industrial plastics, machinery & tools, etc.

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Profit Trend Up Slightly

Selected Metalworking Firms	First Half Net Earnings 1957	1956	PER CENT CHANGE* Behind	Ahead
American Air Filter Co. Inc.	1,140,265	740,560		→ 54
American Metal Products Co.	2,921,612	2,195,736		→ 38
American Steel Foundries	6,133,273	6,709,522	8 ←	
Aro Equipment Corp.	655,750	502,329		→ 30
Beryllium Corp.	703,647	569,328		→ 23
Bridgeport Brass Co.	2,854,654	2,528,008		→ 13
Caterpillar Tractor Co.	27,389,486	27,380,627		→ 00.03
Chrysler Corp.	89,740,757	18,671,471		→ 394
Continental Can Co. Inc.	19,575,000	20,561,000	5 ←	
Diamond T Motor Car Co.	391,206	1,028,818	62 ←	
Douglas Aircraft Co. Inc.	[a] 17,994,289	12,820,637		→ 40
Eaton Mfg. Co.	6,586,156	7,459,750	12 ←	
Elliott Co.	1,021,792	891,145		→ 14
Fairbanks, Morse & Co.	1,443,991	1,310,557		→ 10
Federal-Mogul-Bower Bearings Inc.	5,145,000	4,814,000		→ 7
Ferro Corp.	877,659	1,300,936	32 ←	
Foote-Burt Co.	438,965	107,053		→ 310
Ford Motor Co.	171,000,000	131,070,000		→ 30
General Electric Co.	127,823,000	112,864,000		→ 13
General Motors Corp.	481,236,708	503,471,823	4 ←	
General Steel Castings Corp.	1,577,707	1,513,132		→ 4
Hoskins Mfg. Co.	744,500	791,170	8 ←	
IBM Corp.	40,061,507	31,868,620		→ 25
Jorgensen (Earle M.) Co.	1,501,636	1,374,962		→ 9
Koehring Co.	1,541,996	1,279,960		→ 20
Mack Trucks Inc.	6,508,316	5,754,031		→ 13
Minneapolis-Honeywell Regulator Co.	10,304,470	9,560,314		→ 8
Monarch Machine Tool Co.	678,485	483,953		→ 40
New York Air Brake Co.	1,326,572	1,162,958		→ 14
Pittsburgh Screw & Bolt Corp.	1,143,737	1,046,120		→ 10
Porter (H. K.) Company Inc.	3,460,268	3,991,746	13 ←	
Radio Corp. of America	20,311,000	20,037,000		→ 2
Rockwell Spring & Axle Co.	8,585,165	7,091,580		→ 7
Scullin Steel Co.	575,400	240,318		→ 140
Stanley Works	2,071,383	2,455,796	16 ←	
Thompson Products Inc.	8,323,211	4,861,842		→ 71
Transue & Williams Steel Forging Corp.	353,357	320,153		→ 10
Union Carbide Corp.	69,601,905	72,789,578	4 ←	
United States Pipe & Foundry Co.	4,782,504	5,368,370	11 ←	
Vertol Aircraft Corp.	1,322,079	1,755,868	24 ←	
Wayne Pump Co.	307,299	658,684	53 ←	
Westinghouse Air Brake Co.	6,640,686	6,135,849		→ 8

(a) before special charge of $1,320,066.
* Approximate.

WITH SOME notable exceptions, metalworking had a better first half in 1957 than it did in 1956. The outlook for the second half is good, but appliances, construction and automobiles will need an upswing if the industry is to overtake its 1956 profits.

Steelmakers could have a near-record year, despite a spotty first half and a softening in the market the past month. A. B. Homer, president, Bethlehem Steel Corp. states: "It looks as if the low point has been reached." Bethlehem expects to be operating at about 88 or 89 per cent of capacity through August, and September will be a little better. In the fourth quarter, it looks for a rate of about 90 per cent. Present rate: 85 per cent.

Metalworking

Although most blue chip companies reported a better first half this year than last, about 30 per cent of all companies surveyed by STEEL had lower net earnings. While five out of six firms look forward to a better second half, few think it will be substantially better. Manufacturers are divided on whether total net income will exceed 1956's. Most think it will.

But for the universal problem, the profit squeeze, first half earnings would have been much better than they were.

Cases in Point—Says Raymond F. Evans, chairman, Diamond Alkali Co., Cleveland: "Earnings were affected by three major factors: Erosion of profit margins due to increased costs of labor, materials and transportation; accelerated research and development programs; and start-up costs of expansion programs."

Continental Can Co.'s sales rose 3 per cent, while profits dropped 5 per cent. Smaller companies were even harder hit. Van Norman Industries Inc., Springfield, Mass., had a sales increase of over 55 per cent, while its profits rose only about 9 per cent. Another indication of the situation: General Motors Corp.'s employment was down 18,650, but its labor costs rose $14 million.

Outlook—By product classification, the second half shapes up like this:

Aircraft — Thompson Products Inc., Cleveland, notes that aircraft sales reached an "all-time peak" early in the year before leveling off during the second quarter, reflecting the changing military program. The odds are better than 2 to 1 that this year will exceed 1956. Two partmakers report first half peacetime records.

Automotive — Despite a record first half for Chrysler and substantial gains by Ford Motor Co. and Mack Trucks Inc., the period did not live up to predictions. But

sales of 1958 models this year are expected to keep earnings significantly ahead of 1956's.

Nonferrous—Most companies report lower sales and net earnings in the first half as a result of reduced demand and weakening prices.

Zinc, lead and copper people look for lower dollar sales volumes and earnings in the second half. Sales of aluminum may rise in the third quarter, but earnings are likely to stay static.

Appliances—Sales in 1957's first half about equaled those in the same 1956 span, but net earnings fell. Borg-Warner Corp. reports a decrease in earnings due to the effects of a price war. General Electric Co. notes that "the usual spring upsurge in purchases did not take place." Other contributing factors: Reduction in housing starts, cool weather, which held down air conditioning sales, and softening of prices.

Most manufacturers expect a slight upturn in the second half. Aerovox Corp. predicts a rise in TV and radio sales. Radio Corp. of America expects the already strong sales of phonographs to become stronger. Raytheon Mfg. Co. is relying on a government backlog to increase its second half sales.

Machinery — Sales were up slightly, and net income about equaled last year's. Heavy equipment and electrical apparatus continued strong; industrial equipment was steady; farm equipment sales were about the same as last year's; construction machinery was down.

Manufacturers look to a better second half. A few feel that this year's net income will exceed last year's.

Office Equipment—Business machine manufacturers look forward to another record year. International Business Machines Corp. reported earnings which were about 25 per cent above those in the comparable period last year. National Cash Register Co. had first half net sales of about $183 million, versus about $155.5 million in the same 1956 period.

Electronics — Sylvania Electric Products Inc. reports a "sharp increase" in sales of receiving and picture tubes to other set manufacturers; production is at an annual rate "above that of a year ago." RCA's tube division also is doing better than it did last year.

Consolidated Electrodynamics Corp., Pasadena, Calif., set all-time records in earnings, sales and new orders during the first six months of 1957.

Selected Steel Companies	First Half Net Earnings 1957	1956	PER CENT CHANGE Behind	Ahead
Alan Wood Steel Co.	936,000	1,287,000	26 ←	
Allegheny Ludlum Steel Corp.	7,742,092	9,090,579	14 ←	
Armco Steel Corp.	30,510,292	37,097,427	18 ←	
Barium Steel Corp.	3,340,000	2,914,000		→ 14
Bethlehem Steel Corp.	103,701,162	95,262,014		→ 8
Colorado Fuel & Iron Corp.	8,904,714	8,709,970		→ 2
Continental Steel Corp.	1,686,310	1,590,404		→ 7
Crucible Steel Co. of America	6,045,996	8,086,794	25 ←	
Detroit Steel Corp.	1,863,964	4,142,551	54 ←	
Granite City Steel Co.	6,261,956	7,672,822	19 ←	
Inland Steel Co.	29,764,456	28,960,481		→ 3
Jones & Laughlin Steel Corp.	26,593,000	30,909,000	13 ←	
Kaiser Steel Corp.	14,908,487	11,736,188		→ 27
Laclede Steel Co.	1,865,514	2,161,531	13 ←	
Lone Star Steel Co.	6,664,060	4,798,689		→ 39
National Steel Corp.	26,108,847	28,961,410	11 ←	
Pittsburgh Steel Co.	3,621,323	4,781,107	24 ←	
Republic Steel Corp.	52,917,897	51,532,452		→ 3
U. S. Steel Corp.	231,421,308	208,550,441		→ 11
Washington Steel Corp.	†1,464,847	1,245,168		→ 18
Youngstown Sheet & Tube Co.	21,924,309	21,522,772		→ 2

† 9 months.

Steelmakers

First half (especially second quarter) earnings were hurt by unusually high scrap costs and widespread liquidation of inventories by steel users. But E. J. Hanley, president, Allegheny Ludlum Steel Corp., says: "We are beginning to see improvement in both areas."

C. M. White, chairman, Republic Steel Corp., blames the slower second quarter partially on the fact that some large customers were not producing up to expectations.

Earnings Going Up — J. L. Mauthe, chairman, Youngstown Sheet & Tube Co., thinks that the fourth quarter will show "a marked improvement in steel demand." Other producers agree. Lone Star Steel Co. expects second half sales volume to exceed its record first half by at least 5 per cent.

Earnings Good — U.S. Steel Corp.'s net income for the first six months was a new high for any comparable period. First half sales (over $2.3 billion) also hit a new peak.

Kaiser Steel Corp. reported an increase in first half net profit of 27 per cent over the like 1956 period. Jones & Laughlin Steel Corp. reported the highest second quarter net income in its history. But its earnings for the half were down 13 per cent from 1956's first half.

Fourth Quarter Bright — Most producers expect 1957's fourth quarter to be an extremely prosperous one. "Business from the automotive industry should increase considerably," comments Henry A. Roemer, president, Sharon Steel Corp.

"Our major accounts are raising their sights on fourth quarter requirements," states M. J. Zivian, president, Detroit Steel Corp. Alan Wood Steel Co. expects to operate at or near capacity during 1957's last three months.

Joel Hunter, president, Crucible Steel Co. of America, adds: "While orders for several important product lines have been declining recently, we expect a reversal of this trend late in the third quarter. Earnings in 1957 should be spread more evenly than they were in strike-affected 1956."

Defense Plan Hit

A new study requested by the Defense department points up our lack of planning

TOO MANY PLANS and lack of co-ordination among the various agencies of government—those are the points made by the National Security Industrial Association in a study of defense mobilization planning. The study was requested a year ago by the Defense department, so it may be considered a semiofficial document. Consensus: Look for some changes in our war planning.

Short War? — The association disposes of the short war-long war controversy with this cogent phrasing: "Any planning which contemplates a build-up of weapons production after a nuclear attack is not sound." Conclusion: "There remains peripheral, economy draining warfare (with either conventional or nuclear weapons) . . . this is the only type of warfare against which production allocation planning can be effective."

Who Knows?—The association's main effort is to get Defense to tell industry more about its needs. It recommends that the department conduct a series of expensive studies (with the aid of the latest calculating devices) on industry's composition.

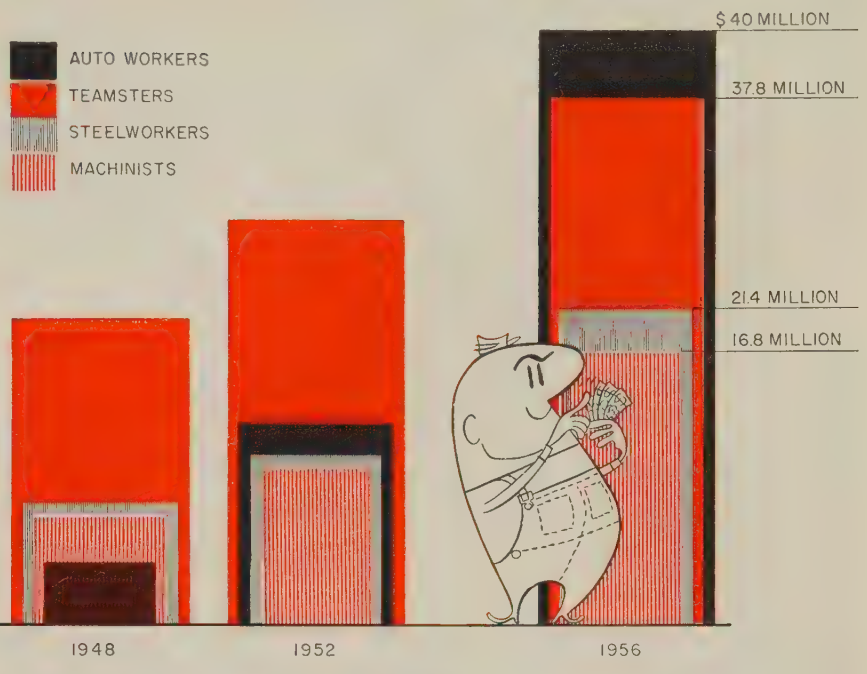
Machine Tools—In this field, the association says: "Evidence was submitted . . . to cause concern as to the reality of planning . ." It predicts the greatest bottleneck would be in the delivery of machine tools and related equipment. It endorses a tool reserve and the trigger tool program but suggests prototype production lines of items required in wartime which are limited in peacetime output.

Components — The association wants Defense's Preferential Planning List (PPL) of critical items kept as small as possible.

Supply Sources—Finally, the association accuses Defense of not following its own rules by failing to set up several sources of supply of critical end products: "Too often price prevails in the awarding of PPL items contracts at the expense of long range planning."

Big Unions Are Big Business

Financial Resources



Should They Be Regulated?

IN EIGHT YEARS, the combined resources of four unions—auto workers, teamsters, steelworkers and machinists—have grown from $39.6 million to $116 million.

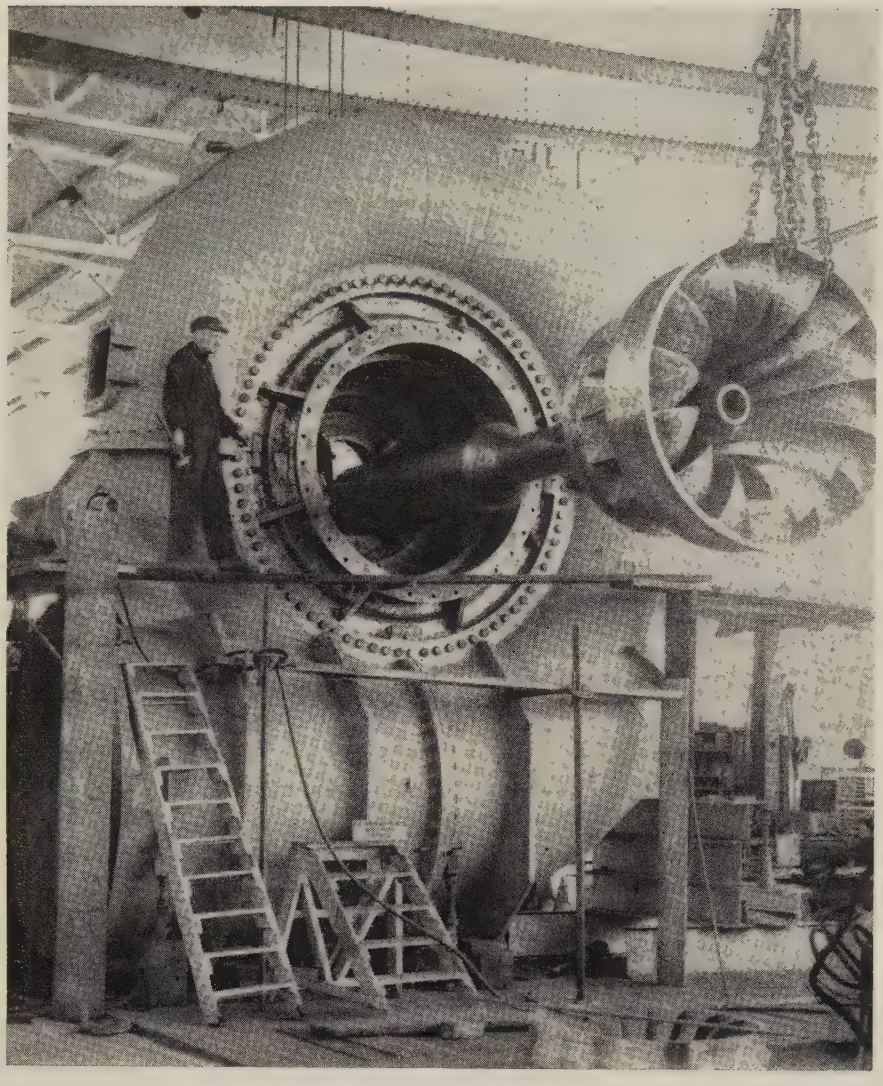
Accompanying that spectacular gain has been an alarming increase in union power to restrain business, charges H. A. Toulmin Jr., chairman, Commonwealth Engineering Co., Dayton, O.

In an article prepared for the August issue of *Competition,* Commonwealth's house publication, Mr. Toulmin points out that labor organizations control manufacturers by: 1. Preventing them from shipping their goods. 2. Lending them money. 3. Buying their stock. 4. Meddling in labor negotiations not concerning them.

Double Standard—If one business attempted to control another by such means, says Mr. Toulmin, it would be prosecuted for violation of antitrust laws. Unions are exempt on the ground that they are not businesses. "The men who voted for these exemptions," he continues, "were doing nothing less than selling their votes in Congress for support by the most unscrupulous elements in organized labor."

The Supreme Court has held three times that labor organizations are illegal monopolies. On each occasion, Congress has reversed the court by changing the law. Now the court has ruled that teamsters may refuse to handle the goods of a manufacturer whose plant has been struck by another union. "The court is not to be blamed," Mr. Toulmin asserts, "since it has simply construed the law as enacted by Congress."

Remedy—Mr. Toulmin advocates that the Supreme Court, its subordinate federal courts and the Department of Justice be given authority to maintain free commerce and to apply the antitrust laws without discrimination.



Scroll and gate casing of a Leffel turbine which was installed at Los Angeles

Specialization Pays Off

James Leffel & Co., pioneer builder of hydraulic turbines, resists diversification. After 95 years, this Ohio firm is still going strong in the field it knows best

"WE'RE in a small industry with greater demands for technical background and capital investment than many that are much larger."

In those words, J. Robert Groff, president and general manager of James Leffel & Co., Springfield, O., offers a capsule judgment of the hydraulic turbine business, a highly specialized field in which Leffel has prospered.

To advocates of diversification, Leffel may look like an anachronism: Its products include nothing that is unrelated to the making of power. What's more, a major share of its income is derived from the sale of hydraulic turbines, the firm's chief product since 1862.

Early Years—When the company was founded, there were two known sources of power, water and coal. Water was used by mills to turn wheels of Leffel's design and to saw lumber, grind wheat, gin cotton, loom cloth and make paper —through mechanical drives. Coal was used to fire steam boilers.

After 1911, many water wheels were stripped of their belts and gears and were connected to generators. Water power was translated into electric power, with consequent gains in efficiency. Cashing in on its long experience with turbines, Leffel made additional progress in another field. It offered Scotch-type boilers to those who needed process steam.

Products—Today, Leffel's products include: Hydraulic turbines from the smallest sizes up to units of about 60,000 hp; Scotch-type boilers (to 500 hp) which can be fired with coal, oil or gas; stokers for Scotch boilers; steel pipe lines; drain valves; penstocks; headgates; headgate hoists; and trash racks.

It operates in a single highly integrated plant that has 135,000 sq ft of space. Facilities include a machine shop with vertical boring mills, lathes, planers and drills; a boiler shop; a gray iron and bronze foundry; a pattern shop; a power plant; and an office building.

Employees—Close to 200 are on the payroll—40 do engineering work. The company "makes" its own skilled workers by using men of long experience to train co-op students from high schools and colleges. High school students alternate four-week periods of classroom study with equivalent periods of factory work. Older men with no industrial experience are not disqualified. Leffel recently hired a cook, aged 40, and turned him into a lathe operator.

Unlike many other firms, Leffel makes no recruiting drives for engineers at colleges and universities; it accepts their applications and hires them as vacancies occur and their abilities warrant.

Customers — Government sponsored power projects, private utilities and industrial plants provide the principal markets for Leffel's turbines. Its Scotch boilers (for heating and process steam) are used by more than 100 industries.

Fifty years ago, about 100 domestic producers made hydraulic

turbines. Today, no more than ten are in the business. Leffel's competitors include Allis-Chalmers Mfg. Co., Milwaukee; Baldwin-Lima-Hamilton Corp., Eddystone, Pa.; Newport News Shipbuilding & Dry Dock Co., Newport News, Va.; and S. Morgan Smith Co., York, Pa. "Leffel's success can be attributed to the fact that it concentrates its efforts in a particular field and endeavors to produce efficiently in that range," says Mr. Groff. Other assets: A reputation for quality workmanship and good service; production of a boiler line which supplements turbine output; management's ability to co-ordinate the company's growth with that of the market.

Expansion — In 1935, Leffel bought the water wheel business of Trump Mfg. Co. and of Hoppes Water Wheel Co., both of Springfield, O.; last year it acquired the hydraulic turbine business of Rodney Hunt Machine Co., Orange, Mass.

Although the firm retains manufacturers' agents and territorial representatives, it often finds it preferable to use its own engineers as salesmen because of the increasing technicalities of the business. In sales to Latin American countries, it is sometimes represented by American electrical companies. In Canada, the firm cooperates with its associate manufacturer, Canadian Vickers Ltd., Montreal, supplying runners for turbines which that company fabricates. Leffel does not license foreign manufacturers for the building of hydraulic turbines under its designs.

Markets — The foreign market accounted for about one-third of Leffel's sales during the 1940s. With Europe at war, it was possible to sell successfully in Mexico and South America. Today, foreign sales are less than 5 per cent of the company's annual volume. Reason: Competition from European producers, whose labor costs are one-fourth those of Leffel's.

With the foreign market virtually closed to American turbine builders, domestic sales are vitally important. Mr. Groff and his colleagues express concern about the government's acceptance of foreign bids on domestic power projects.

U.S. Leads in Atom Power

Russian claims are discredited by Atomic Energy Commission official. U.S. nuclear power capacity will reach 133 million kw by 1977, one-fourth of total electricity needed

THE U.S. is leading in the nuclear power race and will stay in front if it can transfer development from government to private industry economically, believes W. Kenneth Davis, director, Division of Reactor Development, AEC.

He thinks Russia's "plan" to have over 2 million nuclear kilowatts by 1960 is nothing more than bold exaggeration.

Our Timetable—Mr. Davis predicts the U.S. will have about 1 million kw of nuclear power capacity in operation five years from now. It will grow to 7.5 million in ten years, 43 million in 15 years and 133 million (close to our present electrical generating capacity) in 20 years. By 1977, we'll need four times that amount of power.

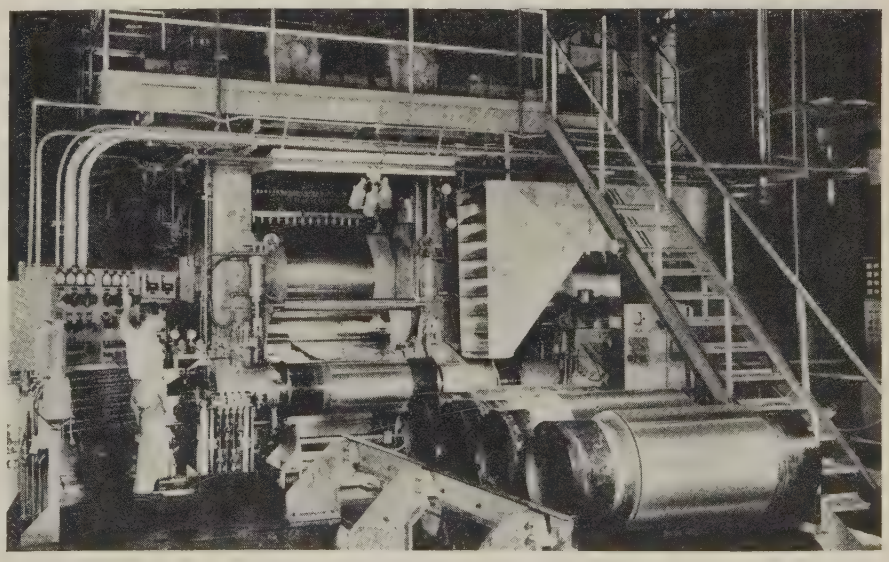
USSR Program — It appears that the Russians hope to obtain technological guidance by watching U.S. advances. Evidently, they have discovered that it takes more than a simple flow diagram to build a nuclear reactor, says Mr. Davis.

Actually, Russia's planned capacity is little more than 1 million kw, but he warns not to be complacent about their activity—or lack of it. Communist reports are vague; their capacity and know-how uncertain.

British Gaining — The United Kingdom is gaining ground rapidly, largely because it faces a different set of economic problems. Conventional fuel is not only scarce in England, but it's two to three times as expensive as it is in America. Development and maintenance costs are less expensive.

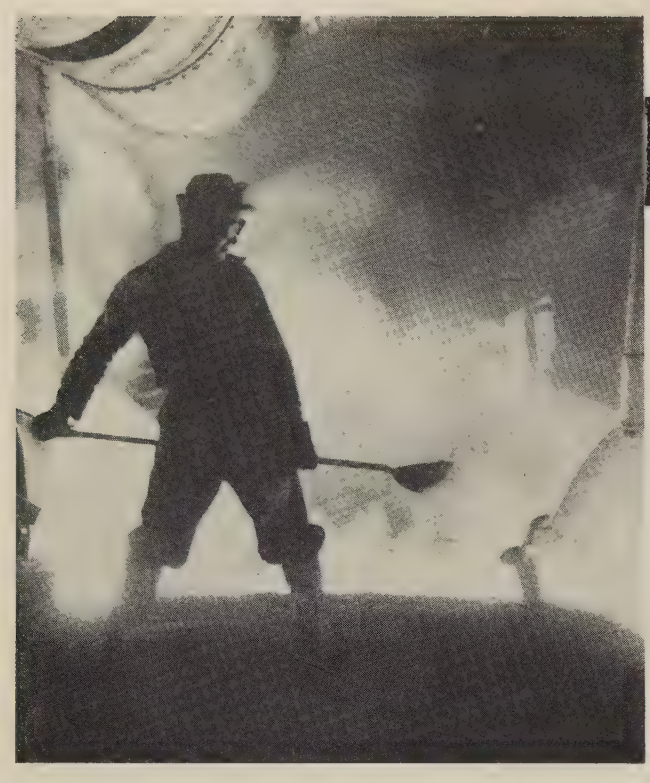
While the U.S. must develop an efficient reactor to compete with conventional fuels on a cost vs. productivity basis, the United Kingdom can effectively use the less economical reactors.

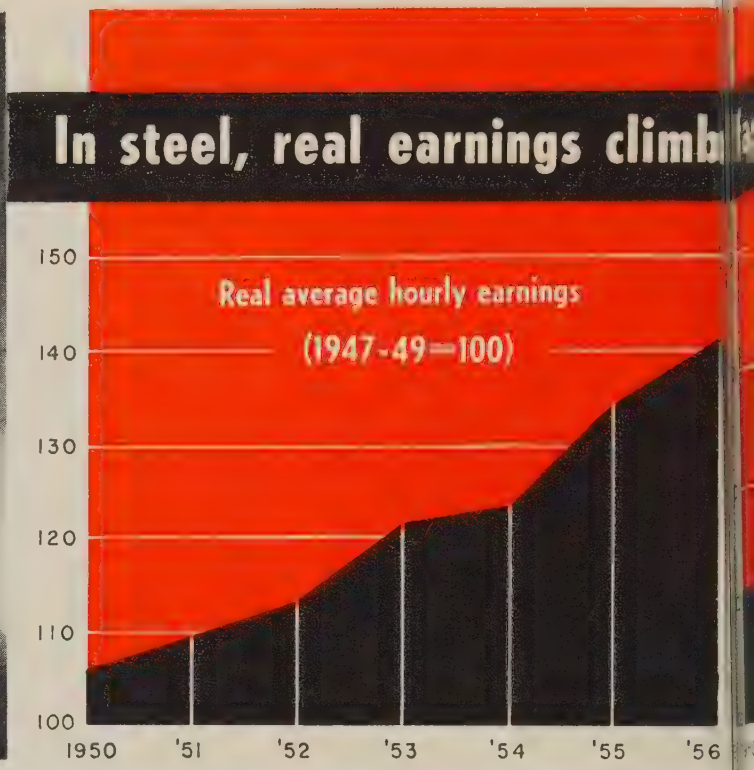
U.S. Growth Factors—The rate of development of the U.S. nuclear power industry depends upon: 1. The rate at which development is pursued and its success; 2. Its favorable transition to private industry. 3. The eventual economics of nuclear vs. conventional power.



Kaiser's New Foil Mill Has Flexibility

This mill was recently installed at the Ravenswood, W. Va., plant of Kaiser Aluminum & Chemical Corp. Built by the Lewis Machinery Division of Blaw-Knox Co., Pittsburgh, it has a top speed of 3000 ft per minute and can roll aluminum in gages from 0.026 to 0.00025 in.





What Causes Inflation?

The chance for a serious study of the question has been passed up by Congress. Don't expect anything better as we move closer to the election years of 1958 and 1960

BUREAU of Labor Statistics' reports on productivity in U.S. manufacturing may be just too hot to handle.

(If you can decide what causes inflation, you have the answer to the most important problem in American economics. But if the party which controls Capitol Hill fears the decision, no answer will come.)

No Congressional Action — The charts above illustrate the steel industry's present predicament. The first two come from the Joint Economic Committee's study of "Productivity, Prices and Incomes." That committee is supposed to be the watchdog of the economy for Congress. Its bark is a little weak, however. The report has been available to Congress for a month; yet, no senator or representative has demanded an investigation of the causes of inflation as outlined in over 200 pages of data gathered from half a dozen government bureaus.

A committee staff member comments:

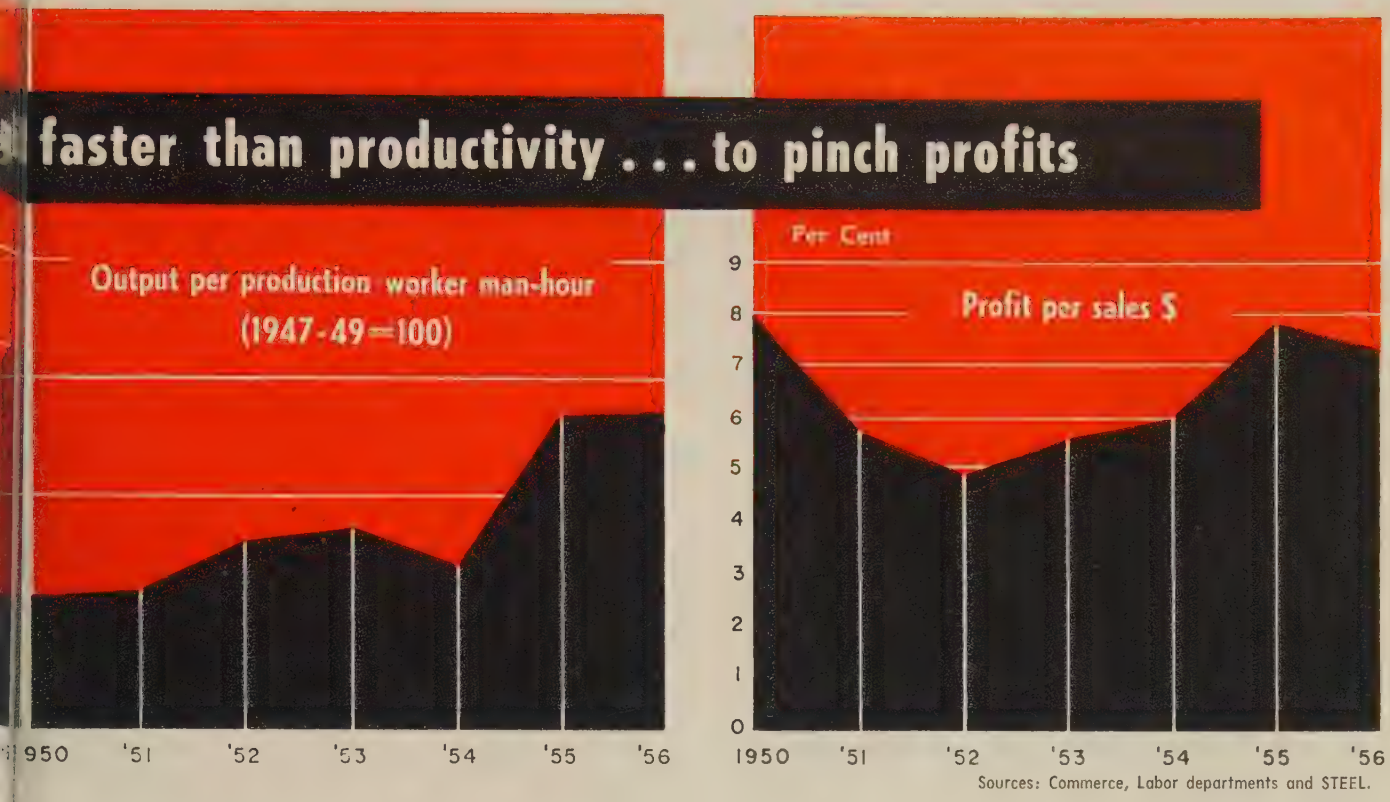
"We are waiting for someone else to pick up the ball. By its nature, congressional investigation must be specifically in terms of an industry or a company; our committee will not dig that deep."

Productivity, prices and incomes, continues the committee staff man, are just a part of the bigger picture, which includes profits, marketing and general fiscal policy. Other congressional committees are at work, too.

Sen. Harry Byrd's (Dem., Va.) Finance committee is grilling the Treasury department on monetary matters; on Aug. 6, Sen. Estes Kefauver's (Dem., Tenn.) Anti-trust & Monopoly subcommittee will start to hear testimony from the steel industry on administered prices. But don't look for these efforts to get close to what many economists consider the root of our economic problems: The relationship between productivity and wages.

Government Hedging — In its part of the study, the Bureau of Labor Statistics carefully notes: "The answer to the question of whether the wage increases cause the price increase or vice versa cannot be determined from the figures alone."

Yet, average hourly compensation of private nonagricultural workers stood at 132.6 (1947 = 100) in 1956, and real production per employee hour was 126.1. While private nonagricultural production has gone to 182.9, employee com-



Sources: Commerce, Labor departments and STEEL.

pensation was 183.5. Nonlabor payments were 182.1. (All figures are in constant dollars.)

Industry's View—One Washington source guesses that over $1 billion will be paid to workers this year in increased wages (based on contracts signed in 1955 and 1956). Those contracts include clauses for annual wage boosts plus cost of living increases. That $1 billion doesn't include wages negotiated this year and has no relation to increased productivity, he says.

Industries such as steel have been able to keep profits at even the present minimal levels (see third chart) through mechanization, better work methods and similar improvements. Proving that are ratios between the steel industry's wage bills and the value added by manufacture in the industry. Despite higher individual wages, the payroll as a percentage of value added has been dropping since 1952—47.4 per cent in 1952, 43.9 per cent in 1953 and 41.3 per cent in 1954.

Labor's View—Labor counters this argument: Cost of living increases come months after the higher prices are paid. Contends James Carey, president, International Union of Electrical Workers: "It is high time that the government investigate the relationship of prices and profits."

But a public study of profits would lead to wages, and the unions don't really want a full-scale investigation, no matter how loud they yell for it.

The Middle Road—Serious students of the economy in Washington (and there are more than you might think) are advocating a shift in congressional interest from inflation to another subject: Automation's effect on the economy during the 1960s. They regard inflation as political dynamite which no legislator, no matter how honest, can force himself to live with for long. In a study of automation, the shorter work week and the power of Congress to enforce the Full Employment Act, the economists think we might get to practical cases at last.

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, O.*

Missiles Appear in Write-Offs

Ten new certificates of necessity for accelerated tax amortization have been issued by the Office of Defense Mobilization under the goal for production facilities for military or AEC procurement. One other was issued under the steel castings goal. Total certified exceeded $30.5 million.

Largest amounts involved uranium mining and processing facilities: Homestake-Sabin Partners, Valencia and McKinley counties, N. Mex., 80 per cent on $12,250,400; Texas-Zinc Minerals Corp., Mexican Hat, Utah, 80 per cent on $8,452,366, and Homestake-New Mexico Partners, McKinley county, N. Mex., 80 per cent on $207,190 (mining only).

For guided missiles facilities, Martin Co., Orlando, Fla., was allowed 65 per cent on $2,879,250, $1,272,300 and $887,685.

For steel castings facilities, National Malleable & Steel Castings Co., Superior, Wis., was granted 65 per cent on $3,475,000.

Military jet engine parts were included in other certificates.

Public Power Block Forces Ike's Hand

THE administration is going to have to live with public atomic power:

The Joint Atomic Energy Committee has approved a public power enthusiasts' bill which provides for the operation of federally designed and built power reactors by five co-operative groups. The Atomic Energy Commission wanted the groups to build the reactors themselves, but the energy built up by the recent Idaho Power-Hell's Canyon controversy has spilled over into a flood of protest against giving private power companies too much control over our atomic power programs. It will be almost politically impossible for administration forces to ask the President to veto the bill.

This action won't keep private industry from developing its own atomic power plants, of course, but it isn't designed to encourage them either. (See page 59 for latest estimates of the growth of atomic power for electricity in the U.S.)

Move To Dump AEC Grows

Democrats are pushing the idea that the AEC is too big and powerful. Look for a move in 1958 at appropriations time to get some of the AEC functions split off: Radiation effects, to the U.S. Public Health Service; nuclear weapons, to Defense department; nuclear power, to Federal Power Commission; industrial atomics, to Commerce department.

More On an Iowa Steel Mill

North American Steel Co.'s drive for an integrated mill at Clinton, Iowa, isn't dead, yet. The firm has applied for another extension to its request for fast tax write-offs on a $300-million mill. First requested six years ago, North American has had five extensions while it looked for the money to finance the 1-million-ton unit. It has told Office of Defense Mobilization it can start construction in December.

North American has a technical chance of getting the write-off because its application was in long before the steel expansion goal was closed in 1953. If ODM granted such a proposal, however, it would open itself up to giveaway charges.

GSA Puts Pressure on Aluminum

In an unusual maneuver last week, Franklin Floete, head of the General Services Administration, requested a hearing before the Joint Committee on Defense Production. Subject: Aluminum "puts." (Under the Defense Production Act, Aluminum Co. of America, Kaiser Aluminum & Chemical Corp. and Reynolds Metals Co. have been putting excess production to the aluminum stockpile.)

Putting began last December. As of July 10, the three firms had sold GSA 582.5 million lb (Alcoa 351 million lb; Kaiser, 127.5 million lb; Reynolds 104 million lb) at 25 cents a lb. The material is worth $145.6 million.

GSA's objection: Alcoa and Kaiser are importing aluminum from Canada under contracts calling for delivery of 1.5 billion lb. The committee wants to know: Is the government buying aluminum at 25 cents, while the U.S. firms are importing it at less?

It Wants To Control "Puts"

But GSA is after something more solid. Mr. Floete told the committee he has been negotiating with Alcoa and Kaiser to limit their puts on the basis of their Canadian imports. Under the contracts with the three biggest aluminum producers, GSA can be required to take as much as 1.37 billion lb; the last contract (one with Reynolds) expires in July, 1959; the others expire this year or next. Since Reynolds doesn't import Canadian aluminum, Mr. Floete isn't too concerned with its puts, but he wants Alcoa to deduct 75 per cent of its imports from what it has a right to put, Kaiser 80 per cent. In addition, he wants Alcoa to increase its offering to nonintegrated aluminum mills from the present 25 per cent of production to 35 per cent, Kaiser from 25 per cent to 33.3 per cent.

The two companies tentatively agree to the suggestion, and Mr. Floete brought it before the committee before clearing it with other U.S. agencies.

Committee Chairman Sen. A. Willis Robertson (Dem., Va.) is openly doubtful of the whole stockpile program.

U.S. Tool Funds Asked

Sen. John Sparkman (Dem., Ala.) has introduced S2595 to establish working funds for the "procurement and replacement" of government machine tools and related production equipment. It's now in the hands of the Armed Services Committee and could be voted out before this session of Congress ends. The bill stands little chance of getting through both houses though. Defense Mobilizer Gordon Gray proposed the funds last spring (STEEL, May 13, p. 75).

Funds for tools will come from three sources if the bill is passed:

1. Rentals from private industry.
2. Price concessions to the government based on the free use of tools.
3. Depreciation allowances of tools owned by the U.S.

Samples of SIC Revisions

While none of the 20 established major 2-digit groups of the standard industrial classification has been eliminated, merged or changed, numerous products and groups of products have been regrouped or moved from one major classification to another. Here are examples in the major metalworking groups—33 through 37.

Major Group 33—Primary Metal Industries

Old SIC put blast furnaces in industry 3311 under major group 33 and steelworks and rolling mills in 3312. Now both are put in one industry, SIC 3312.

Major Group 34—Fabricated Metal Products

Classifications for coatings, engravings and allied services, formerly in 346, have been shifted to 347. That number once meant lighting fixtures. An SIC detective now finds lighting fixtures deep in an entirely different major group —36.

Major Group 35—Machinery Except Electrical

The machine tool industry is defined differently in the revised SIC. It's divided into machine tools-metal cutting types (3541), machine tools-metal forming types (3542), dies, tools, jigs and fixtures (3544) and machine tool accessories and measuring devices (3545).

Major Group 36—Electrical Machinery

Electrical and electronic measuring instruments, assigned 3613 under old SIC, get a new home in 3611, which has been broadened in the revised SIC. Under old SIC it meant just wiring devices and supplies.

Major Group 37—Transportation Equipment

Guided missiles, which formerly had industry number 3721 (aircraft), are shifted to Major Group 19—Ordnance, and are assigned number 1929.

Census SIC System Revised

A MARKETING TOOL has just been honed to new sharpness, but it won't be in wide use by industry until 1958 and 1959.

It's the government's standard industrial classification (SIC), a system under which industry groups are assigned numbers for identification. U.S. Bureau of the Census statistics are gathered according to SIC breakdowns. Many companies now use SIC for their marketing research purposes.

Old Pattern Holds—The government's 1954 Census of Manufactures, now being published, continues under the old system. For that reason, STEEL's new book, *Metalworking Markets in the U.S.A.*, uses the old SIC. Most companies already using SIC won't need to convert for another year or two.

That's because the government won't make extensive use of its new SIC until the Census of Manufactures for 1958, which won't start being published until about 1959. But for companies planning to go to SIC for the first time, it would be wise to adopt the new classification.

New Pattern—Copies of the government's *Standard Industrial Classification Manual—1957,* which describes the revised pattern, can be purchased for $2.50 from the U.S. Superintendent of Documents, Washington 25, D.C., or from any Commerce department field office.

A task force to study revisions has been working since 1953. The job took one year longer than expected. Much of the initiative for the task originated with the Advisory Council on Federal Reports, a private group. A task force chairmanned by P. K. Lawrence of E. I. du Pont de Nemours & Co. recruited more than 300 industry representatives to work on 26 different industry committees to examine industries, definitions and descriptive material for each SIC group. Their work was under the general supervision of Horace Stringfellow of U.S. Steel Corp. The final document now available for use beginning in 1958 or 1959 represents a compromise between changes industry people proposed and what government people thought practical.

Origins — While classification patterns were developed by the Census Bureau during the early days of the Census of Manufactures, the first standard system applying to all U.S. statistics didn't evolve until 1945 when the government published the first SIC manual.

By the time of the 1954 Census of Manufactures, the Census Bureau found it had to make a number of departures from old classifications because they were ambiguous, either from inadvertency or from extensive industrial changes obsoleting old categories.

The revisions should help you pinpoint markets more exactly for a more effective marketing job.

How Many People Do What in Marketing?

(color rules indicate areas where more people are or will be needed)

LINE SALES	3,300,000
PROPRIETORS & MANAGERS	3,000,000
Service Workers	2,700,000
Delivery & Operating Personnel	2,350,000
CRAFTSMEN & SUPERVISORS	1,450,000
Clerical	1,390,000
PROFESSIONAL	475,000
Manual laborers	335,000
Total	15,000,000

Estimates by STEEL, based on Bureau of Census and U.S. Chamber of Commerce figures.

Needed: More Marketers

A changing economic climate puts more emphasis on marketing. Look for a greater demand for marketing personnel. Here are tips on what you can do now

THE NEXT serious personnel shortage will come in marketing.

It's not widely noticeable yet, but here are some warnings:

- Display classified advertising in the ten most populated areas shows that an average of 121 positions in marketing were open each week in the first half of 1957, compared with 107 per week in the second half of 1956. The information comes from Executrend, a continuing survey conducted by Heidrick & Struggles, a Chicago management placement firm.
- "Definitely more sales jobs have opened up in the last few months," says Dale E. Barbee, placement director at Case Institute of Technology, Cleveland.
- "Every one of our recent marketing and merchandising graduates has been able to get a job readily," says Mrs. John A. Le Bedoff, director of placement service for Western Reserve University, Cleveland.
- "Since the first of the year, a pronounced shift has occurred in our personnel needs," says the personnel manager for a Philadelphia company. "The clamor used to be for engineers. Now that has let up a little, but the pressure's mounting to get marketing men."

What's Marketing?—The term implies the integration of all functions in finding out what is wanted, measuring the demand, planning the product and moving it to the final user. It involves product planning, customer research, marketing research, advertising, sales promotion, sales, distribution and service.

Of an estimated 15 million people employed in all phases of marketing in America (see table), about one-third are in managerial or specialized roles. The shortages will be most severe there and in line sales jobs. Specialized functions include market research, advertising, sales promotion. National Sales Executives Inc. estimates that American industry is short more than 400,000 people in the sales area alone.

Why a Shortage? — Marketing personnel are and will continue to be scarce because of the change in economic conditions. We have achieved a balance between supply and demand in almost every segment of industry. In some cases, supply exceeds demand. When the balance was the other way, the emphasis was on production—and on the people, such as engineers, needed to achieve more output. Now the emphasis is on sales — and on the marketing people to dispose of more goods.

The shift in emphasis has led to the broader concept of marketing, as opposed to the more limited idea of sales (STEEL, June 17, p. 93). The restructuring of organizations to embody the marketing philosophy may have led to considerable slippage in figuring the number of people needed, believes James H. Riggs, manager of marketing research for Bendix-Westinghouse Automotive Air Brake Co., Elyria, O. But he and others agree that, even if the shortage is overestimated, it still exists.

What To Do About It—You can relieve the scarcity and prepare for its increasing severity three ways: 1. Make better use of the marketing people you have. 2. Keep those you have. 3. Recruit and train new ones.

Better Use—U.S. manufacturers probably employ 600,000 of the nation's 3.3 million sales people. That's an increase of about 30 per cent from prewar days, yet each sales person is being asked to sell more than twice as many goods. It's the whole marketing team's job to make those sales people more productive. Each call by an industrial salesman costs an average of $21; every sale, $230. You're wasting time, money and effort if your salesmen are chasing smokestacks, talking to poor prospects or neglecting good ones.

Needed is a marketing policy, says R. J. Miller, Cleveland Electric Illuminating Co.'s manager of sales promotion. It should state objectives and work out the budget in terms of people and money to carry out the goals.

Ideal planning includes concentrating on the big buyers in the top 30 per cent of the market but

To relieve the shortage in marketing personnel . . .

Know your markets better

1. What are total requirements of each prospect and customer?
2. What percentage of each customer's needs are you selling?
3. What accounts are unprofitable to sell?
4. What old customers have stopped or curtailed buying? Why?
5. When did a salesman last call on each customer and prospect?
6. How does each salesman's performance compare with his quota?
7. Which territories are too large or small for one salesman?

Keep the good people you have

1. With fair compensation.
2. With personal recognition and fair credit where it's due.
3. With their participation in as many marketing plans and decisions as possible.
4. With greater understanding of an individual's problems.
5. With a good supervisor in whom subordinates can have confidence.
6. With a product that can be respected.
7. With ample opportunity for personal advancement.

Train your people better

1. Get management approval and participation in training.
2. Be sure that the budget for training purposes is adequate.
3. Select the right people to do the training.
4. Train the trainers.
5. Keep checking results to correct bad points in the program.
6. Have a continuous program for new personnel and a periodic retraining program for more experienced people.
7. Pick and train potential supervisors.

still not neglecting the potentials among the less exploited 70 per cent. It's the market analyst's job to sift out the top 30 per cent. It's the advertising and sales promotion manager's task to prepare them for the salesman's call.

An Indiana company found that over 40 per cent of its accounts were unprofitable—they added only 10 per cent to sales volume. By dropping them gradually, the firm cut marketing expenses in half. Another company found that nearly half its stock brought in less than 5 per cent of volume. Eliminating some items and handling others on a special order basis had little effect on volume but increased profits markedly.

Keep What You Have—How do you keep good marketing people from quitting? Robert Zinn, vice president-sales for Standard Register Co., Dayton, O., producer of business forms and systems, says it costs his company $6500 to break in a new salesman. There are few figures available on other types of marketing personnel, but the expense is high.

You can reduce personnel turnover through better selection and placement, adequate training, improved internal communications, high-caliber supervision and equitable compensation. Inequitable pay is rarely the sole reason for a man leaving. But pay must be fair. A top market analyst should make about the same as a top salesman. Too often a salesman's earnings are higher than those in other areas of marketing. Here's a rough indication of average compensation for salesmen these days: A cub—$600 per month; a medium performer (in sales volume, age and tenure) — $1000 per month; a top performer—$1500 per month.

Recruit and Train—Recruiting techniques for marketing personnel are the same as for engineers or any other type of job—college visits, advertising, referrals by your employees.

Marketing management finds its greatest problems in training. Some 10 per cent of the 15 million in marketing are still inexperienced, estimates the U.S. Chamber of Commerce. (The ratio isn't that high in manufacturing.) It's costing about $1.5 billion a year to train these people—also relatively more than it's costing in manufacturing.

Here are some ways you can spend your training dollar more effectively.

One approach is to study some of the techniques used to train production employees — high-caliber supervisors, movies to show how the job should be done, arrangements with neighboring colleges or high schools to handle some courses.

Another approach is to extend your sales training to other marketing personnel or to adapt training schools of other organizations to your own purposes if you have none.

Marketing expenses take an average one-tenth of the sales income dollar in 64 companies surveyed by American Management Association. That cost ratio will rise if you aren't prepared to meet present and future personnel shortages. One year ago, an aircraft company estimated its engineering expenses would have been cut 20 per cent if it had had enough engineers. Can you afford marketing costs one-fifth higher because of insufficient marketing people?

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service,* STEEL, *Penton Bldg., Cleveland 13, O.*

UAW Vs. Decentralization

Union is disturbed because auto makers and suppliers are moving some operations out of Michigan. Calls strike at Monroe plant in effort to prevent transfer of equipment to Georgia

LOOK FOR the United Automobile Workers to step up its campaign against decentralization as more car builders and their suppliers show inclinations to move out of Michigan to escape a tough corporate tax situation and high labor rates.

The UAW doesn't seem to be disturbed by the principle of decentralization per se, but it is up in arms because of its end result in Michigan. A labor surplus exists, according to Michigan's Employment Security Commission, and the UAW feels it must be strong enough in its own backyard to maintain solidarity around the country.

Policy—Walter Reuther, UAW president, voiced the union's position a year ago when he warned members of the Dodge local in Detroit: "If Chrysler moves Dodge out of Hamtramck, it will become a ghost town."

That kind of desperate thinking was used in the union's fight for transfer rights at Chrysler (STEEL, May 27, p. 68), and now it looks as if the same line will be taken against other firms, particularly auto suppliers, that move to join the exodus.

Example—Monroe Auto Equipment Co., Monroe, Mich., is feeling the effects.

A study of the Maeco strike illustrates what conditions prod the UAW into action. Auto suppliers with decentralization plans might keep these facts in mind.

Firm Moves Out — Maeco produces shock absorbers, sway bars, power steering parts and other suspension components. It has two plants in Monroe and one in Hillsdale, Mich. The company recently built a fourth plant in Hartwell, Ga.

The Hartwell plant is not organized. It has about 250 employees, compared with 650 in Monroe and 100 in Hillsdale.

William D. McIntyre, executive vice president and general manager, says one of the basic reasons for building the Hartwell plant was that shipping costs are cheaper from Hartwell to 65 per cent of the Ford Motor Co. plants which buy Maeco shocks.

People in Monroe say the UAW has feared the firm would eventually move all operations to Georgia.

Mr. McIntyre says this won't happen. He points out the company has been in Monroe since 1917, adding: "We have too great a capital investment in Monroe to pull out now."

Blames High Wages—At the same time, he admits Monroe's wage rates are among the highest in the state. This, even more than high taxes, has kept the company from increasing its local work force, he says.

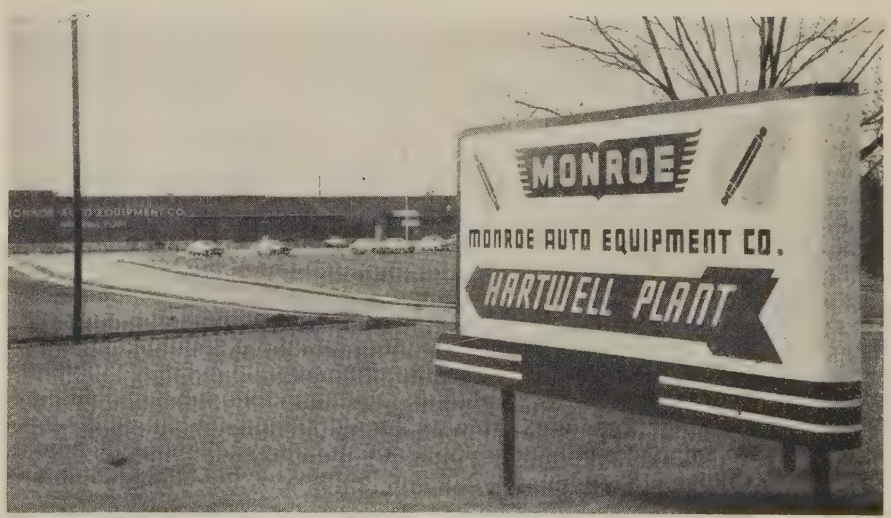
As an example, Mr. McIntyre cites payment by Maeco of 15 cents an hour more to assemble sway bars than does Ford at its parts plant (also in Monroe, but under a Detroit UAW contract).

A wage study by the state's Employment Security Commission confirms that Monroe's labor rates are among the highest in Michigan.

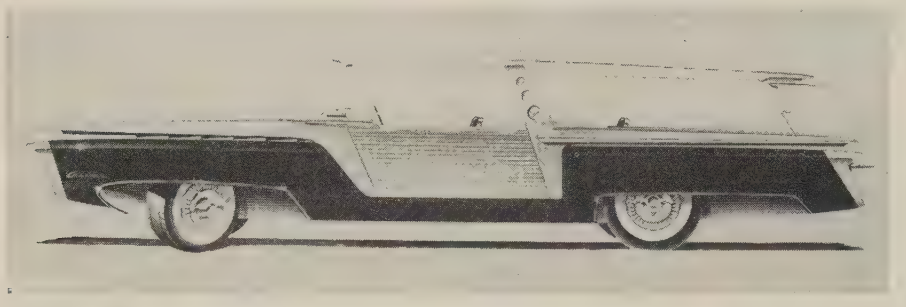
"These are the reasons why independent suppliers can't bid economically enough to keep auto makers from bringing work into their own plants," explains Mr. McIntyre. Last year, the company bid on $65 million worth of work which it didn't get. Mr. McIntyre feels high wages are one of the reasons bids were too high.

Grievances Mount—Mr. McIntrye says grievance costs have been averaging $35,000 a year in Monroe, compared with $2000 in Hillsdale.

Current difficulties started last year when the company bid on a Ford contract. Mr. McIntyre claims the company made an agreement with UAW Local 878 that if Maeco got the job the work



UAW is fighting transfer of equipment from Monroe, Mich., plant to Hartwell, Ga., plant of Monroe Auto Equipment Co. Company says it's needed to fulfill contract with Ford which local agreed to last year



Dream Cars Sketched by Aluminum Producer

Kaiser Aluminum has come up with these composite designs to point up how use of aluminum could be extended in the automotive field. Featured are extruded frame members, rolled-down doors and cast bumpers

would be done in Georgia. Apparently, it never was clearly established that this would require moving some equipment from Monroe to Hartwell.

Strike—When the move started this June, Local 878 charged the transfer of equipment was against contract provisions. It struck one plant in Monroe and has obtained an injunction to prevent the company moving out equipment.

Both the union and Maeco feel the strike will be settled shortly. The international has stepped in, and Emil Mazey, international UAW vice president, is leading the union side in negotiations.

There's talk of a wage fight between the international and Local 878. There also are hints the union offered to settle if Maeco would guarantee it a closed shop in Hartwell. All parties involved deny the rumors.

Despite the battle, Mr. McIntyre says he expects gross sales this year will total between $16 million and $17 million, compared with $13 million last year.

Future Cloudy—The strike continues, and 360 workers are idle. Mr. McIntyre says it will remain closed until the contract expires Sept. 1, 1958, if necessary. "Then we'll hire people not covered by a contract," he asserts. If this happens, Maeco could become another Kohler Co.

Ford Says Sales Are Up

First half reports show Ford Motor Co. has increased its sales to a record $3 billion, 27 per cent above last year's. Net earnings were $171 million ($3.15 per share), compared with $131.7 million ($2.44 share) in the first half of '56.

Factory sales of cars and trucks totaled 1.1 million. Henry Ford II, president, says that's the second highest first half in company history, exceeded only by 1955. Last year Ford sold just over a million vehicles in the first half.

U.S. Auto Output

Passenger Only	1957	1956
January	642,089	612,078
February	571,098	555,596
March	578,826	575,260
April	549,239	547,619
May	531,365	471,675
June	500,271	430,373
6 Mo. Total	3,372,888	3,192,601
July		448,876
August		402,575
September		190,726
October		389,061
November		581.803
December		597,226
Total		5,802,808

Week Ended	1957	1956
June 29	125,909	103,034
July 6	73,682	68,110
July 13	111,943	112,361
July 20	124,894	113,416
July 27	128,149†	120,416
Aug. 3	130,000*	124,416

Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.

GM Says Income Is Down

General Motors reports net income for the half of $481 million ($1.71 per share), compared with $503 million ($1.80 per share) last year.

Even though income is off, Harlow Curtice says GM's dollar sales ($5.9 billion) are second only to 1955's first half. Last year, first half sales were $5.8 billion. In 1955, they totaled $6.5 billion.

Mr. Curtice says the corporation has sold 1.7 million cars and trucks from U.S. manufacturing plants so far in 1957. That's 11 per cent below last year at the same time.

Unit vehicle sales from all GM manufacturing sources are only 8 per cent below 1956's.

Chrysler Keeps Smiling

Confirming earlier reports, L. L. Colbert, Chrysler president, says the corporation's first half dollar sales totaled $2 billion, an increase of 44 per cent over the $1.4 billion total in the same period of 1956.

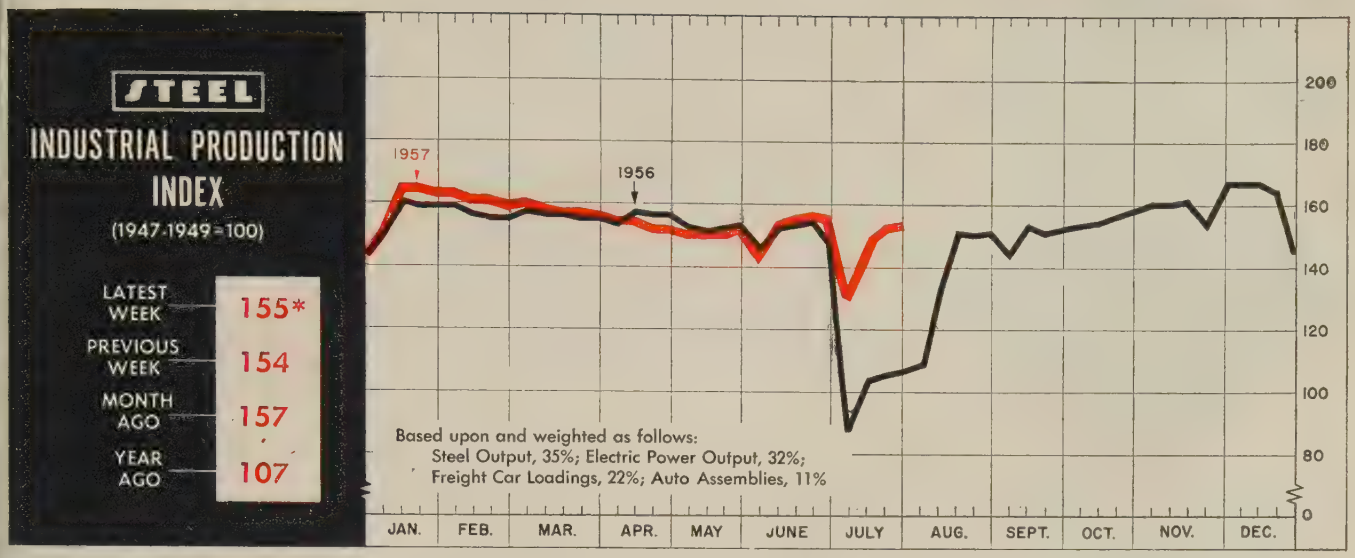
Net earnings are $98.7 million ($10.28 per share), compared with $18.6 million ($2.14 per share) last year.

Defense sales have declined from 8 per cent last year to 3 per cent of total sales for this year's first half, adds Mr. Colbert.

During the first six months, Chrysler shipped 817,501 cars and trucks. Last year it shipped 592,501 vehicles in the first half.

GM Gets Tax Aid

The Office of Defense Mobilization announced that General Motors Corp. may write off $4,586,850 in taxes during the next five years for depreciation on its guided missile plant at Oak Creek, Wis.



*Week ended July 27.

Indicators Show Basic Vigor of Business

IT now seems pretty certain that the over-all economy has enough momentum to make a strong finish in 1957.

Here's STEEL's estimate of what some of the major economic indicators will average for the year (comparison is with 1956):

Gross national product, $430 billion vs. $412 billion.

New plant and equipment expenditures, $37.4 billion vs. $35.1 billion.

Federal Reserve Board index of production, 145 per cent of the 1947-1949 average vs. 143 per cent.

U.S. auto assemblies, 5.8 million, no change.

Steel output, 117 million tons, which will equal (or slightly surpass) the previous peak of 117 million tons in 1955.

Appliances Pick Up

Among the encouraging signs of a good second half is the comeback being made by major appliances.

The American Home Laundry Manufacturers' Association reports that factory shipments of home laundry appliances during June increased 14 per cent over those in May—although shipments of 341,062 units were 15 per cent beneath the year-ago figure.

Guenther Baumgart, executive director of the association, says a number of factors point toward a more favorable second half. There are widespread reports of increases in retail sales during recent weeks, and retail inventories appear to be declining.

Another plus factor: New models are beginning to show up. They usually stimulate sales in the fall. June dryer sales were 48 per cent greater than they were in May, which may mark a turning point for industry sales.

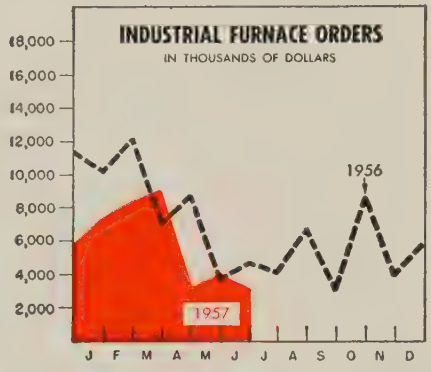
Summing Up—Although the in-

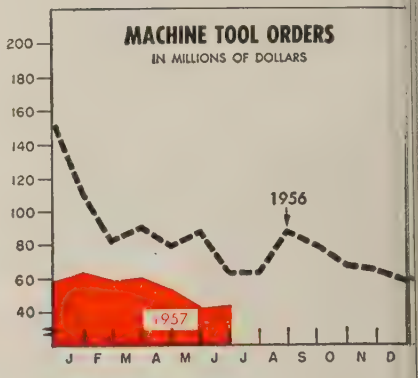
BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	2,103[1]	2,033	415
Electric Power Distributed (million kw-hr)	12,500[1]	12,200	10,800
Bituminous Coal Output (1000 tons)	7,750[1]	1,500	7,145
Petroleum Production (daily avg—1000 bbl)	7,100[1]	6,880	7,000
Construction Volume (*ENR*—millions)	$400.6	$386.3	$391.3
Auto, Truck Output, U. S., Canada (*Ward's*)	151,189[1]	148,551	144,000
TRADE			
Freight Car Loadings (1000 cars)	800[1]	743	652
Business Failures (Dun & Bradstreet)	271	266	251
Currency in Circulation (millions)[3]	$31,000	$30,099	$30,632
Dept. Store Sales (changes from year ago)[3]	+3%	+5%	+2%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$21,204	$22,291	$22,396
Federal Gross Debt (billions)	$272.5	$272.8	$272.9
Bond Volume, NYSE (millions)	$15,578	$19,245	$17,827
Stocks Sales, NYSE (thousands of shares)	12,122	9,032	11,311
Loans and Investments (billions)[4]	$87.0	$87.6	$84.9
U. S. Govt. Obligations Held (billions)[4]	$25.6	$26.0	$26.3
PRICES			
STEEL's Finished Steel Price Index[5]	239.15	239.15	210.45
STEEL's Nonferrous Metal Price Index[6]	216.6	216.4	261.1
All Commodities[7]	118.0	118.0	114.1
Commodities Other Than Farm & Foods[7]	125.4	125.4	121.3

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1957, 2,559,490; 1956, 2,461,893. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

THE BUSINESS TREND





	1957	1956	1955
Jan.	7,380	10,244	4,973
Feb.	8,373	12,163	5,616
Mar.	9,090	7,025	7,345
Apr.	3,164	8,803	7,639
May	3,994	3,667	6,205
June	2,974	4,748	5,812
July	....	4,140	4,338
Aug.	....	6,722	6,273
Sept.	....	3,057	8,351
Oct.	....	8,741	9,575
Nov.	....	3,986	6,180
Dec.	....	5,858	11,105

*Not including new orders for steel mill furnaces.

Industrial Heating Equipment Assn. Inc. Charts copyright, 1957, STEEL.

(Thousands of Dollars)

	New Orders		Shipments	
	1957	1956	1957	1956
Jan.	63.250	109.550	76.550	54.60
Feb.	58.200	81.300	77.700	64.60
Mar.	58.900	89.500	89.100	74.15
Apr.	51.300	79.300	87.800	71.80
May	41.400	87.100	78.500	76.80
June	42,850*	61,850	83,050	76,25
July	.....	61.900	.....	65.15
Aug.	.....	87.500	.....	75.10
Sept.	.....	78.450	.....	71.10
Oct.	.....	66.100	.....	89.75
Nov.	.....	64.250	.....	81.70
Dec.	.....	57,200	.....	85,15
Totals	.....	924,000	.....	886,15

*Preliminary.
National Machine Tool Builders' Assn.

dustrial side of the picture looks bright, John Q. Public views the situation with mixed emotions: Times are good, but his cost of living continues to skyrocket.

Growth Follows Trend

The business community continued to grow in 1956 at about the rate of the long-term trend, reaching 4,301,000 as of Jan. 1, 1957. This meant an increase of about 50,000 firms, with practically all the growth concentrated in the first half, reports the Office of Business Economics in the July issue of *Survey of Current Business*. Despite the increase, manufacturing continued the decline that began in 1952. There were 307,000 such firms at the beginning of the year, compared with 308,700 at the beginning of 1956. All other major groups increased in number.

The trend so far in 1957 is for a slower growth in the business community. Through the first half, business failures were about 11 per cent ahead of the 1956 pace, while business incorporations were about 7 per cent under the year-ago period. But the growth is not likely to slip to the recent low of 10,000 for 1953-54 combined.

Fabricated Steel Holds

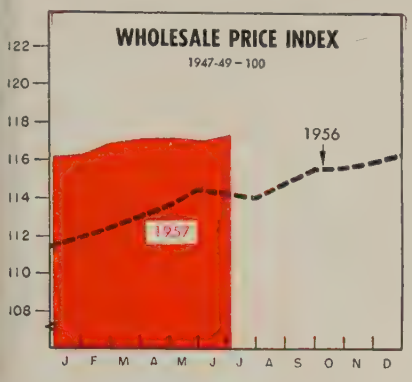
Shipments of fabricated structural steel totaled 329,256 tons in June, just under the record of 329,626 tons delivered to construction sites in May. This activity was 16 per cent above the June, 1956, mark and pulled the midyear aggregate to 1.8 million tons, 5 per cent above the first half, 1956, total.

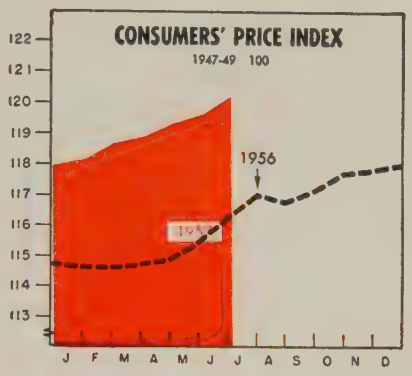
The backlog of new orders was 3.2 million tons on June 30, an increase of 13 per cent over last June's.

The American Institute of Steel Inc., estimates that 1.2 million tons will be fabricated during the the next four months.

The Consumer Pays

When the Bureau of Labor Statistics announced that the consumer price index hit an all-time record of 120.2 in June (1947-1949 = 100), it represented the largest month-to-month gain since the same time last year (see chart, page 75). It also marked the





	All Commodities		Other Than Farm & Foods	
	1957	1956	1957	1956
Jan.	116.9	111.9	125.2	120.4
Feb.	117.0	112.4	125.5	120.6
Mar.	116.9	112.8	125.4	121.0
Apr.	117.2	113.6	125.4	121.6
May	117.1	114.4	125.2	121.7
June	117.4	114.2	125.2	121.5
July	....	114.0	....	121.4
Aug.	....	114.7	....	122.5
Sept.	....	115.5	....	123.1
Oct.	....	115 6	....	123.6
Nov.	....	115.9	....	124.2
Dec.	....	116.2	....	124.6

U.S. Bureau of Labor Statistics.

	1957	1956	1955
Jan.	118.2	114.6	114.3
Feb.	118.7	114.6	114.3
Mar.	118.9	114.7	114.3
Apr.	119.3	114.9	114.2
May	119.6	115.4	114.2
June	120.2	116.2	114.4
July	....	117.0	114.7
Aug.	....	116.8	114.5
Sept.	....	117.1	114.9
Oct.	....	117.7	114.9
Nov.	....	117.8	115.0
Dec.	....	118.0	114.7

U.S. Bureau of Labor Statistics.

Wholesale Prices

tenth consecutive month in which a record has been set. Since June, 1956, the cost of living has advanced 3.4 per cent.

Comparing this with the bureau's wholesale price index (see chart, above) and wage earners' spendable earnings, it appears that the consumer is being squeezed. The wholesale index has gone up only 2.8 per cent since June, 1956. It should be pointed out that part of the rise in the cost of living is seasonal—food prices usually go up in June. Some relief may come as the harvest rolls on, but the percentage relation with '56 will remain steady.

While wage earners are managing to increase their purchasing power, that ability is on the wane. The average pay envelope for a worker with three dependents yielded $75.13 in spendable earnings in June. This was up 68 cents over the May figure and $2.55 over that of the same month a year ago. But the index of "real" spendable earnings has advanced only fractionally from 120.9 to 121.0 (1947-1949 = 100) in that time. Wages are sure to get another hefty cost-of-living boost this summer, but that probably will do little more than cover rising prices.

2nd Quarter Sales Dip

Sharon Steel Corp., Sharon, Pa., reports second quarter net sales of $37.8 million, compared with $50.5 million during the same period of 1956. Earnings were $1.1 million, or $1.03 per share this year, compared with $2 million, or $1.88 per share for the 1956 second quarter.

President Henry A. Roemer expects demand to increase in the fourth quarter with increased business from the automotive industry after 1958 models are introduced.

Trends Fore and Aft

• Revenue freight loadings for the week ended July 20 totaled 743,359 cars, 14.6 per cent above those the same week last year but 4.9 per cent below those in the corresponding week in 1955.

• Domestic gas range shipments for the first half of 1957 totaled 970,600 units, down 10.9 per cent from the same period last year. Deliveries of free standing ranges amounted to 880,200 units, a drop of 13 per cent from the first half of 1956. Built-in ranges gained 16.5 per cent. A total of 90,400 units were shipped in the first half.

6 SPEED NUTS® replace 10 fasteners ...and costs drop 80%!

Six Tinnerman SPEED NUTS replaced 10 weld nuts on the Gibson Window Air Conditioner... and production costs dropped more than 20 cents per unit!

Working with the designers at Gibson Refrigerator Company, Division of Hupp Corporation, Tinnerman engineers suggested using four "J" Type SPEED NUTS to fasten the front panel to the air conditioner cabinet. These one-piece, self-locking, spring-steel fasteners snap in place by hand; are self-retained in screw-receiving position. They also used two Flat Type SPEED NUTS to fasten the window mounting channel to the cabinet.

By eliminating ten weld nuts, Gibson was able to divert a spot welding machine to other uses, reduce materials handling, simplify and speed up assembly. They cut costs right down the line —without sacrifice of product quality!

Savings like this are being made every day when manufacturers switch from ordinary fasteners to Tinnerman SPEED NUT Brand Fasteners. Over 9000 variations are available to handle practically any fastening job, from tiny transistors to huge freight cars.

Send for complete data on how you can make important assembly-cost savings. And investigate the possibilities of having a Tinnerman Fastening Analysis made of your products. Call your Tinnerman representative, or write to:

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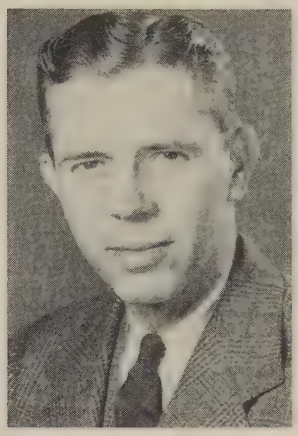
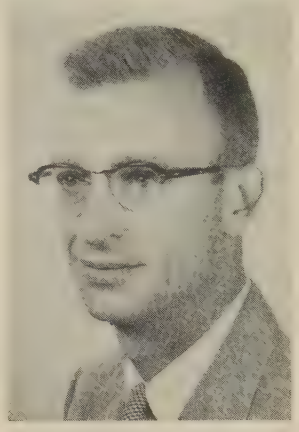
SAM GURLEY JR.
Olin Aluminum v. p.-sales

JOHN H. GREENING
Micromatic Hone chief eng.



O. H. YOXSIMER
Westinghouse plant manager



L. B. LINDEMUTH JR.
Keystone open hearth supt.

Sam Gurley Jr. was appointed vice president-sales for **Olin Aluminum,** Olin Mathieson Chemical Corp., New York. He was vice president-sales at H. K. Porter Company Inc., Pittsburgh.

Micromatic Hone Corp., Detroit, appointed **John H. Greening,** chief engineer; **Edward L. Behringer,** assistant chief engineer.

Munro Corbin, controller of **Rockwell Mfg. Co.,** Pittsburgh, since 1951, was elected vice president and assistant to the president. He is succeeded as controller by **John T. Farrell,** former assistant controller.

Lowell Jensen was made works manager at **Famco Machine Co.,** Kenosha, Wis. He was chief engineer.

Harry A. Collins was made production co-ordinator for fabricated products operations of **Blaw-Knox Co.,** Pittsburgh. **Arthur A. Levison** retired as vice president and sales co-ordinator-fabricated products.

Douglas G. Eaton was made sales manager of vacuum diecasting for **Reed - Prentice Corp.,** Worcester, Mass.

Joseph F. Capoun was elected president, **Columbia Burner Co.,** Toledo, O., to succeed the late **Adolph Schlett.** He continues as general manager and treasurer.

A. W. Fraser was made general marketing manager for **Worthington Corp.,** Harrison, N. J.

O. H. Yoxsimer was made manager of **Westinghouse Electric Corp.'s** East Springfield, Mass., appliance plant, responsible for all operations—including engineering, production and sales. He was manager of the refrigerator-freezer engineering department at the Columbus, O., plant. **J. R. Weaver,** manager of manufacturing and engineering since 1953, retired. **H. R. Bryant** was made administrative assistant to Mr. Yoxsimer. **H. F. Hildreth** was made assistant manager.

David G. Kelton was made an assistant general sales manager by **Cleveland Cap Screw Co.,** Cleveland. He succeeds **Thomas A. Fribley,** now secretary of the company.

Henry P. Lockhart was made assistant general manager of **Austin - Western,** construction equipment division, Baldwin-Lima-Hamilton Corp., Aurora, Ill.

Tipp Mfg. Co., Tipp City, O., appointed **Roy E. Lynch** plant superintendent; **William J. Smith,** chief engineer.

R. W. Munger was named operating manager, foundry division, **Electric Auto-Lite Co.,** at Mt. Vernon, Ill. **R. M. Sellers** was made sales manager for the division.

Carl O. Knierim was appointed manager of heat treat sales for **Gas Machinery Co.,** Cleveland. He was chief engineer, industrial furnace division. **H. A. Anderson** was made chief project engineer.

L. B. Lindemuth Jr. was appointed open hearth superintendent, **Keystone Steel & Wire Co.,** Peoria, Ill. He joined Keystone in 1955 as process control engineer. **A. R. Edwards,** open hearth superintendent since 1950, was made administrative and technical adviser.

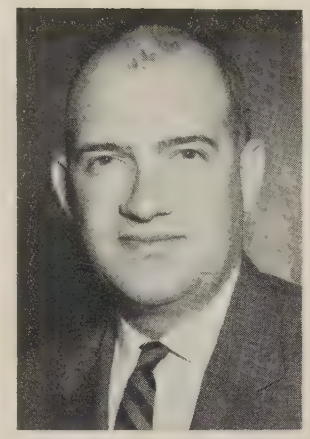
A. Dean Meyer was made general manager, **Ajax Electrothermic Corp.,** Trenton, N. J., to succeed **Guilliam H. Clamer.** Mr. Meyer is also vice president. Dr. Clamer continues as president. **William J. Werts** was named plant manager. **Thomas J. Turner** was made buyer.

SpeedWay Mfg. Division, Thor Power Tool Co., Chicago, elected **J. B. Dempsey** vice president-marketing. He was manager of Thor's electric tool division. **G. R. Winkley** was made vice president, continuing as treasurer. **A. E. Feiereisel,** chief engineer and plant superintendent, was promoted to vice president-engineering.

Emory L. Mainous was named Dayton, O., division works manager for **Lau Blower Co.**

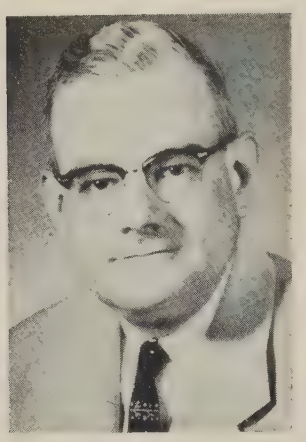
Albert L. Hunt and **Paul J. Bauman** were elected vice presidents of **National Bearing Division,** American Brake Shoe Co. Mr. Hunt is in charge of all manufacturing operations for division plants in St. Louis, Meadville, Pa., and Clearing (Chicago). He continues offices in St. Louis. Mr. Bauman, former general manager of the Meadville plant, now is responsible for the division's indus-

ROBERT L. STRAWBRIDGE



RUSSELL A. JOHNSON

appointments at Wales-Strippit



DOUGLAS R. BEGGS

FOSTER W. EVANS

Carpenter Steel production posts

trial sales. He continues offices in Pittsburgh.

Robert L. Strawbridge was made vice president and general manager, **Wales-Strippit Co.**, Akron, N. Y., a unit of Houdaille Industries Inc. **Russell A. Johnson** was made general sales manager.

Metro P. Sirko was named eastern regional sales manager, **Norden-Ketay Corp.** He is at Stamford, Conn.

Darl F. Caris, head of the research staff's automotive engine department, **General Motors Corp.**, was placed in charge of a newly created power development section which combines engineering and research sections dealing with automotive engines.

A. B. Simmons was made works manager at the Gainesville, Tex., plant of **National Supply Co.** He succeeds **H. E. Heywood Jr.,** transferred to Pittsburgh headquarters as a staff engineer in the manufacturing department.

F. M. Jordan joined **Heil Co.**, Milwaukee, as sales manager, heating and cooling division. He was general sales manager, Timken Silent Automatic Division, Scaife Co.

Donald A. Hayes was made chief metallurgist at **U.S. Steel Corp.'s** Gary, Ind., Steel Works. He succeeds **Harold B. Wishart,** assigned to the corporation's Chicago metallurgical office.

Stanley J. Miller was made assistant director, plant engineering division, **Joseph T. Ryerson & Son Inc.**, at Chicago.

Carpenter Steel Co., Reading, Pa., appointed **Douglas R. Beggs** general superintendent of the Reading plant; **Foster W. Evans,** production manager. **Harold W. Miller,** who continues to head the engineering department, was assigned duties of co-ordinating all engineering functions, including electrical and mechanical maintenance.

O. O. Royer was made assistant general sales manager, **Parker Appliance Co.**, Cleveland. He was marketing manager.

Electro-Alloys Division, American Brake Shoe Co., New York, appointed **Claude E. Christie** and **William D. Raddatz** vice presidents. Mr. Christie is works manager, Elyria, O. Mr. Raddatz is sales manager of the division.

International Business Machines Corp. appointed **R. W. Little** purchasing agent for its time equipment division, Endicott, N. Y., plant; **Harry R. Taylor,** purchasing agent, electric typewriter division plant, Lexington, Ky.

Kaiser Aluminum & Chemical Corp., Oakland, Calif., divided its aluminum operations into five major divisions. The new divisions and their general managers are: Metals, **Stanley B. White;** industrial, **John E. Menz;** electrical conductor, **J. T. Dugall;** products, **Howard C. Holmes;** overseas, **Ray G. Boyd.** Named to the new post of administrative manager is **Fred J. Drewes.** The divisional general managers are responsible to **T. J. Ready Jr.,** vice president and assistant general manager, in charge of all aluminum operations. **Jack W. Watson** succeeds Mr. Menz as general sales manager at Chicago.

E. J. Mulcahey was made product sales manager of **Rexon Vibration Mount Division,** Hamilton Kent Mfg. Co., Kent, O.

Gay V. Land was made vice president, oil department, **Climax Molybdenum Co.**, New York.

Rheem Mfg. Co., Chicago, promoted **Will H. Roy,** a purchasing agent, to the new post of administrator of inventory management and internal control; **Kenneth H. Riha** to assistant to the director of purchasing.

Burton J. Coler was named an assistant sales manager at **Rolled Steel Corp.**, Skokie, Ill.

Adrien F. Busick Jr., vice president-engineering, was promoted to executive vice president and general manager of **Marion Power Shovel Co.,** division of Universal Marion Corp., Marion, O. **David E. Rizor,** vice president, large machine sales, has retired and is succeeded by **Maurice V. Cornell. William R. LeMasters,** secretary-treasurer, was elected vice president.

John F. Kooistra was named western regional manager, machinery and systems division, **Carrier Corp.**, with offices in Los Angeles.

Alectra Division of Consolidated Electrodynamics Corp., Pasadena, Calif., named **Willard T. Holmes** director of engineering; **Roy K. Stephens,** director of manufacturing.

Robert L. Reed was made Pitts-

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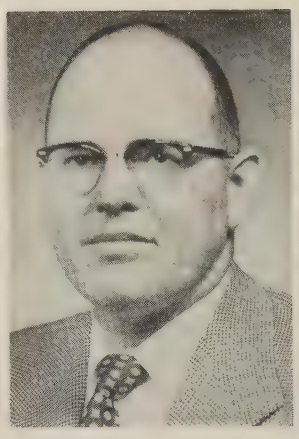
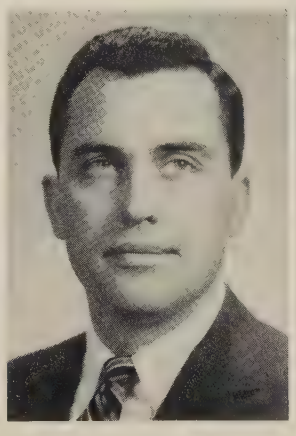
RICHARD H. VALENTINE
New Departure chief engineer



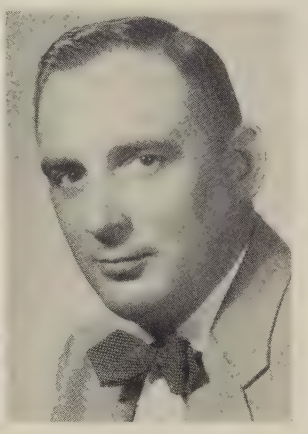
STANLEY S. KRENTEL
MacDermid exec. v. p.

JOHN W. SLATTERY
Crucible supervisor-stainless

RAYMOND J. FORKEY
Coppus Eng. president



JACK W. KNOWLTON
Martin-Decker div. sales mgr.



HARVEY B. WILGUS
Electric Products v. p.-sales

burgh regional sales manager for **Electro Metallurgical Co.**, division of Union Carbide Corp.

Raymond J. Forkey was elected president, **Coppus Engineering Corp.**, Worcester, Mass. He succeeds **Jerome R. George Jr.**, now chairman. Mr. Forkey was vice president-manufacturing.

Jack W. Knowlton was made sales manager, Oiltool Division, **Martin-Decker Corp.**, Long Beach, Calif.

L. T. Letsinger was made works manager of **Aluminum Co. of America's** Davenport, Iowa, fabricating operations to succeed **E. B. Fassel**, now special assistant to the general manager of the fabricating division. Assistant works manager is **S. H. Bennett**, succeeding Mr. Letsinger.

Clyde E. Claus was appointed plant manager at Grand Rapids, Mich., for **Doehler-Jarvis Division**, National Lead Co. He succeeds **Robert H. Mayer**, resigned.

Harvey B. Wilgus was made vice president-sales, **Electric Products Co.**, Cleveland. He has been general sales manager since joining the company in September, 1955. Previously he was general sales manager of Redmond Co. Inc.

Verne H. Feeney was made purchasing agent, **Syncro Corp.**, Oxford, Mich. He was assistant purchasing agent for Gemer Mfg. Co. and had also held that post with Electro-Mechanical Products.

George D. Billock, vice president-treasurer, **Hubbard & Co.**, Pittsburgh, was named to the new post of vice president and assistant to the president. **Marshall S. Delavan** was elected vice president-treasurer.

R. W. Lang was made manager of **Westinghouse Electric Corp.'s** director systems department at Pittsburgh, succeeding **L. W. Golden**, named manager of the general purpose control department, motor and control division, Buffalo.

Richard H. Valentine was made chief engineer, **New Departure Division**, General Motors Corp., at Bristol, Conn. He succeeds **Seth H. Stoner** who recently was made general manager of the division. **Frederick J. Garbarino**, former director of quality control, fills the new post of director of sales and engineering. **Raymond O. Oyler** was made general sales manager; **Robert T. Collins**, director of quality control.

Stanley S. Krentel was elected executive vice president of **MacDermid Inc.** He was vice president of MacDermid Western, Ferndale, Mich., where he continues headquarters.

John W. Slattery was made general supervisor-stainless steel field sales, a new post at **Crucible Steel Co. of America**, Pittsburgh. He was midwest supervisor-stainless steel sales at Chicago.

OBITUARIES...

David A. Crawford, 77, chairman, **Michiana Products Corp.**, Michigan City, Ind., died July 22 in Florida. He retired as president of Pullman Inc. in 1949.

Frederick F. Hickey Sr., 65, a former president, **Savage Arms Corp.**, Utica, N. Y., died July 17.

W. Dean Robinson, 59, former president of **Briggs Mfg. Co.**, Detroit, died July 20.

Edward J. Bothwell, 56, head of distributor sales section, nickel sales department, **International Nickel Co. Inc.**, New York, died July 24.

Gardner J. Mortenson, 69, retired president, **Mortenson Steel Corp.**, San Diego, Calif., died July 23.

C. F. Wahl, 67, retired chief metallurgist, **Pratt & Letchworth**, Buffalo, died July 22.

Robert E. Doyle, 50, Detroit district sales manager, steel and tube division, **Republic Steel Corp.**, died July 21.

Walter Donnelly, 56, works plant manager, **Tomkins-Johnson Co.**, Jackson, Mich., died July 7.

Builds New Mills

U.S. Steel starts two-year project to modernize rolling facilities at Duquesne Works

THREE high-speed rolling mills will replace present facilities for the production of billets, blooms and slabs at United States Steel Corp.'s Duquesne Works, Duquesne, Pa. Construction will start in about three months.

The mills will be in a building to be erected between the Monongahela river and the bar mills at Duquesne. They will consist of a 46-in. high lift, slabbing-blooming mill; a 36-in. blooming mill; and a 4-stand, continuous, 21-in. billet mill consisting of two vertical and two horizontal stands. Each rolling mill will be fully automatic, having its own shears and mill outlets, including facilities to handle the finished product.

Auxiliary Projects — The program also provides for the installation of seven banks of soaking pits, a new stripper building and a new 90 x 864 ft shipping building.

Construction will take over two years to complete. Another year will be required to dismantle the present 40-in. mill, the 38-in. mill and the 8-stand, 14-in. mill.

Harvey B. Jordan, executive vice president-operations, says: "Construction of the new mills will be another big step forward in Duquesne's modernization program which will assure the continuance of the plant's position as a leader in serving the expanding specialized markets for high quality carbon, alloy and stainless steel bars."

Opens Tool Steel Warehouse

Allegheny Ludlum Steel Corp., Pittsburgh, opened a tool, die and high-speed steel warehouse at 155 Washington St., Newark, N. J.

Expands Refractory Plant

H. K. Porter Company Inc.'s Refractories Division will install additional manufacturing facilities at its Canon City, Colo., plant. Productive capacity will be increased by more than 50 per cent. A contract has been signed with the Stearns-Rogers Mfg. Co., Denver, for equipment to manufacture low-alumina silica roof brick by the wet grinding process.

Koppers Gets Republic Work

Koppers Co. Inc., Pittsburgh, has been awarded a contract to rebuild two coke oven batteries and to furnish chemical recovery and coke handling equipment at Republic Steel Corp.'s Cleveland Works. Each of the 51-oven batteries will be able to carbonize 1000 net tons of coal daily, producing 700 net tons of furnace coke. Koppers is rebuilding another 51-oven battery at the same works. It'll be placed in operation within the next few months.

Norton Builds Another Plant

Norton Co., Worcester, Mass., is building a $6.5-million plant to increase production of bonded grinding wheels. It is scheduled to be completed by mid-1959. The firm also is building a $1.5-million refractories plant, a $2-million central service building and a $1-million abrasive supply structure.

Beckman Adds Systems Division

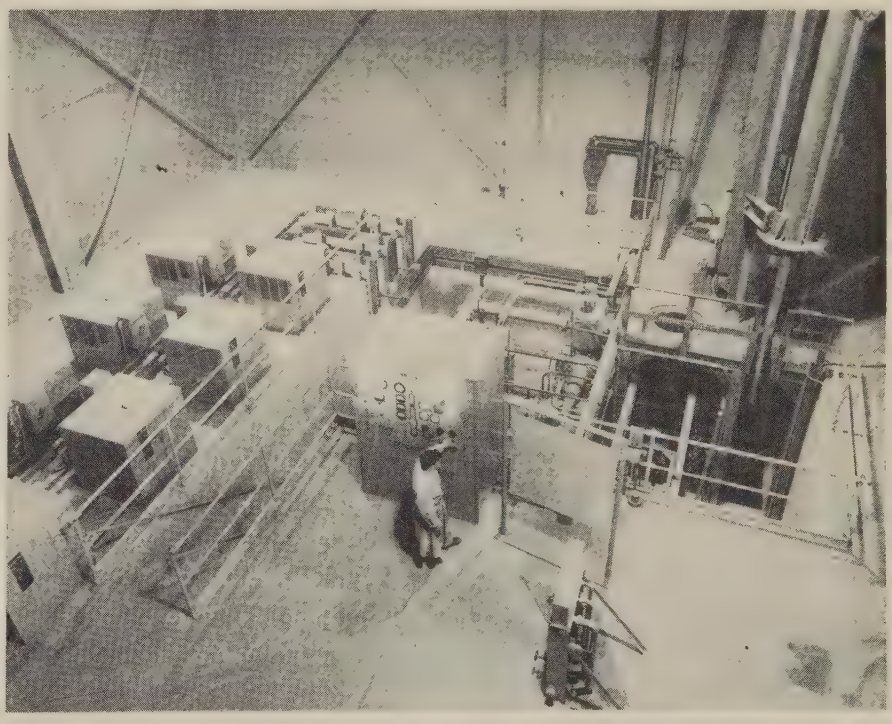
Beckman Instruments Inc., Fullerton, Calif., will form a Systems Division to handle engineering and marketing programs. Heading the new division will be John F. Bishop.

To Build Warehouse in Texas

McCormick Steel Co., Houston, will build a $200,000 warehouse and office building in Corpus Christi, Tex. Robert R. Huffman will head the new operation.

Opens Seattle Steel Warehouse

Summerville Steel Co., newly established steel products distributor, will open a warehouse at 1061 Sixth Ave. S., Seattle, Wash., on Aug. 1. It will stock seamless and welded steel tubing, cold finished bars and tool and alloy steels. Officers are Clyde Summerville, pres-



Universal Activates Vacuum Arc Furnace

A new vacuum arc melting furnace is being used to melt molybdenum and molybdenum alloys at Universal Cyclops Steel Corp.'s plant at Bridgeville, Pa. It also can be used for iron or nickel-base alloys, titanium and zirconium. Capacity: Ingots 16 in. in diameter, 66 in. long. Steel ingots weigh about 3500 lb; molybdenum, 5000 lb. The furnace was built by General Electric Co. At left above, are ten selenium rectifiers, producing a power supply of 15,400 amperes. The vertical cylinder (right, rear) is the electrode housing in melting position. The electrode is lowered into a water-cooled crucible as it melts. Protruding from the pit (to right of furnace) is an electrode ready for the next melt

ident; Jack Toland, vice president; and Earl Anderson, secretary.

Will Erect Houston Warehouse

Metal Goods Corp., St. Louis, distributor of aluminum, brass, copper, nickel and steel products, will erect a $1-million warehouse at Houston next year.

Firm Centralizes After Merger

Weller Electric Corp., Easton, Pa., will centralize production, sales and administrative operations in Easton. Facilities will be erected later this year.

Weller Mfg. Co. and Weller Sales Co. merged into Weller Electric Corp., with Carl Weller as president. The firm makes soldering guns and power tools.

Forms Custom Valve Division

Hydraulic Accessories Corp., Van Dyke, Mich., formed a division to handle its output of custom hydraulic valves for aircraft, industry and agriculture. The firm will increase production of standard valves.

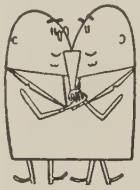
Toolmaker Enters Electronics

Wiesner-Rapp Co. Inc., Buffalo, machine tool manufacturer, established an Electronics Division. The company has been working on a device that uses magnetic tape to operate machine tools by remote control.

Westinghouse Still Expanding

Westinghouse Electric Corp., Pittsburgh, continues to broaden its expansion program. 1. It will build a manufacturing and repair plant in Charlotte, N. C. 2. Enlarge its Cheswick, Pa., facilities for the manufacture of core components and the completion of core assemblies for nuclear reactors. 3. Build an addition to its air conditioning division plant at Staunton, Va.

The 24,000 sq-ft Charlotte building should be completed in mid-1958 and will be equipped to build and service electrical apparatus. The addition of 24,000 sq ft of manufacturing space at Cheswick is the second phase of the company's multimillion dollar, two-year project which began in late 1955. The new building at Staunton will provide an additional 87,000 sq ft of space which will be devoted primarily to warehousing and light manufacturing.



CONSOLIDATIONS

Southington Hardware Mfg. Co., Southington, Conn., will merge with **Pittsburgh Screw & Bolt Corp.**, Pittsburgh. The Southington firm makes wood, sheet metal and machine screws and other special fasteners in diameters up to ⅜-in. Materials include steel, stainless steel, brass, bronze and aluminum.

Thor Power Tool Co., Chicago, acquired **Drying Systems Inc.**, that city, producer of industrial ovens, process air conditioning installations, and electronic controls.

Union Tank Car Co., Chicago, will acquire **Phoenix Mfg. Co.**, Joliet, Ill., subject to approval of stockholders. The transaction will include Phoenix Mfg.'s subsidiary, **Graver Tank & Mfg. Co.**, East Chicago, Ind.

ASSOCIATIONS

T. W. Ernst, Trane Co., La Crosse, Wis., has been named president of the **Heating & Cooling Coil Manufacturers Association**, Detroit.

Representatives of five foundries established a trade organization, the **Aircraft Castings Association.** Its chief aim is to promote "the expanded use of ferrous castings in the aircraft and missile industries." Charter members are: Electric Steel Foundry Co., Portland, Oreg.; Hanford Foundry Co., San Bernardino, Calif.; Pacific Alloy Engineering Corp., El Cajon, Calif.; Stanley Foundries Inc., Huntington Park, Calif.; Lebanon Steel Foundry, Lebanon, Pa.; High Integrity Cast Alloys Inc., Shreveport, La. The group may be contacted through Donald A. Slichter, Pacific Alloy Engineering Corp., 400 N. Richfield Ave., El Cajon, Calif.

REPRESENTATIVES

Bethlehem Supply Co., a subsidiary of Bethlehem Steel Co., Bethlehem, Pa., has been named a distributor of oil field casing and tubing manufactured by **Lone Star Steel Co.**, Dallas. While Bethlehem Supply will begin receiving small shipments of oil country goods in the near future, allocations may not become sizable until Lone Star's new stretch reducing mill and fifth open-hearth furnace are completed and in operation. Walter T. Moreland, vice president-sales for Lone Star, says increased production was the principal reason for adding another distributor.

Harvey Aluminum, Torrance, Calif., appointed Standard Metals Corp., Los Angeles, distributor of its products.

Miami Industries Inc., Piqua, O., maker of electric welded tubing, appointed Perry McAllister, Western Springs, Ill., as its representative for northern Illinois, Iowa and Wisconsin.

NEW ADDRESSES

United Die & Engraving Co. moved to enlarged quarters at 4701 W. Electric Ave., West Milwaukee, Wis.

As of Aug. 1, the general sales administration of **Reading Anthracite Co.** will move from Philadelphia to 400 Park Ave., New York 22, N. Y. The new quarters also will accommodate the New York district sales office, which will vacate its present offices at 140 Cedar St., New York 6, N. Y. The Philadelphia-southern district office will remain at 725 Reading Terminal, Philadelphia 5, Pa.

Burroughs Corp.'s Electro-Data Division moved its Los Angeles district office to 230 N. Lake Ave., Pasadena, Calif. Electro-Data's main plant is at 460 Sierra Madre Villa, Pasadena.

Technical Outlook

PLASTIC COATED STEEL— Look for more applications of this material, especially in automotive and architectural fields. U.S. Steel is trying out vinyl coated sheets on the exterior of a maintenance building and on parts of a central machine building at the corporation's sintering plant under construction near Saxonburg, Pa. The vinyl coating is applied to galvanized sheets—a variety of colors and thicknesses is being used to see how each holds up under weathering. The sheets are being made on an experimental basis at U.S. Steel's Irvin Works.

DIECAST V-8 OUTBOARD— Diecast motor blocks are closer for outboards than they are for autos. A large Wisconsin outboard motor builder is developing a V-8 with an aluminum block that will turn up 85 hp. Some of the tooling is in Detroit die shops now. (For more developments in diecasting, see page 89.)

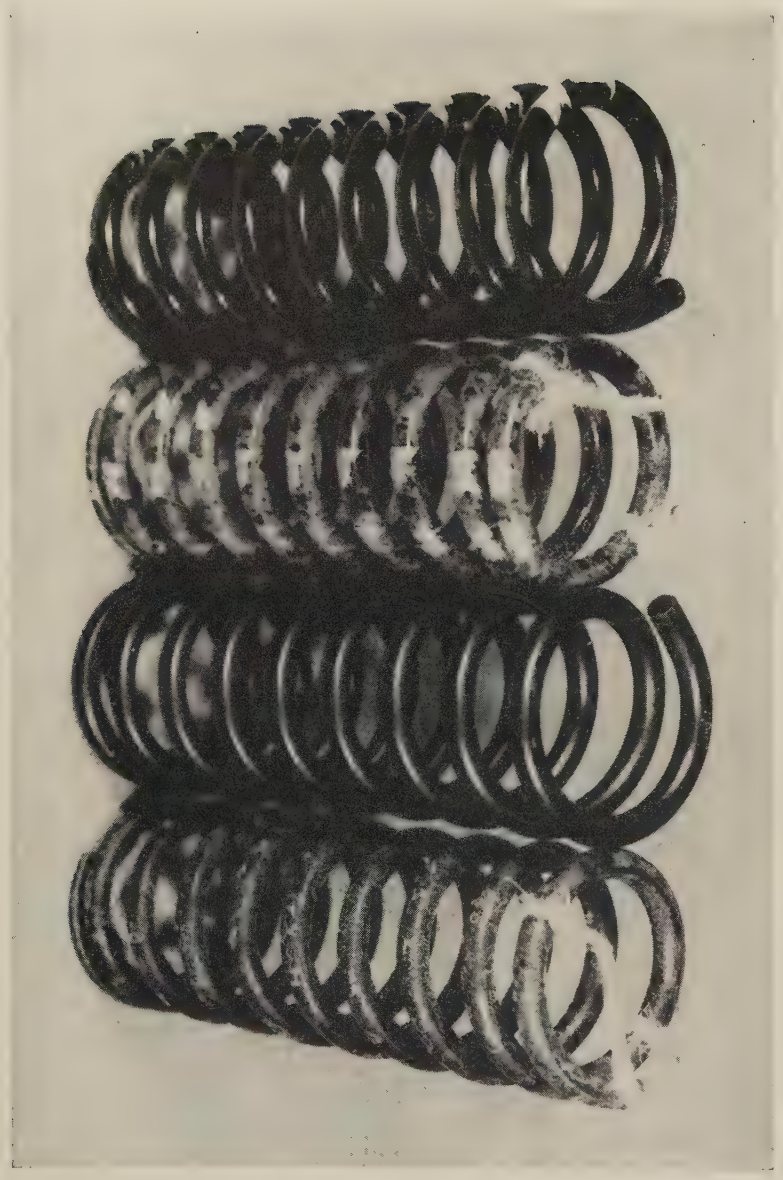
FELTED FIBERS— A new porous metal sheet material is made of felted metal fibers. Porosities can be varied over a wide range. Uses might include high temperature filters for aircraft engines, a honeycomb structure to fill tail and rudder sections and a porous material for transpiration cooling systems. Where the fibers have been used as reinforcement in plastics and ceramics, they have provided a high elastic modulus and avoided problems of abrasion.

HEAT RESISTANT COATINGS— Makers of heating appliances can use aluminum coated steel parts for service up to 1030°F, says the American Gas Association. The decision was based on test units fabricated from Armco aluminized steel Type 1. This raises the temperature level about 200°F over carbon steel and permits the design of smaller heating units with no reduction in Btu. Other conclusions from the lengthy investigation: 1. Steel is protected by the aluminum coating up to 1200°F, with or without sulphur in the gases. 2. The coating protected even after it was intentionally damaged. 3. Welding had no harmful effects.

TESTING REACTOR— Outside Pittsburgh, Westinghouse has broken ground on a site for a full-scale testing reactor. Known as WTR, it will operate in the 20,000-kilowatt range and will be used to test materials under conditions similar to those in a power reactor.

SANDWICH WELDER— A method developed by the Linde Co., a division of Union Carbide Corp., New York, joins spaced sheets like those in an auto radiator. It uses standard sigma spot-welding and requires little preparation. An arc melts a hole through the top sheet. Molten metal fuses to the lower sheet. A column of metal builds up until it fills the hole and fuses with the top sheet. Weld nuggets act as spacers —they double rigidity, increase bursting strength. Each requires less than 4 seconds to make.

MORE FROM TAR— Koppers has opened a new plant at Arroyo, W. Va., which will concentrate on producing and finding applications for high boiling fractions of coal tar which have not been made commercially. R. R. Holmes, vice president and general manager of the Tar Products Division, says: "Of the more than 200 compounds in coal tar, only six or eight have found any extensive use." One of Koppers' products will be Niacin, a vitamin B complex used as a nutritive supplement. The plant is within 100 miles of half the tar production in the U.S., the company says.



These springs were subjected to a 20 per cent salt spray for 24 hours. Before and after shots show how the paint held up. Two springs on top have regular coatings. Two on bottom are emulsion coated

Water Paint for Metal Parts

Fire-safe product has durability of thinner-based paints, is quick drying and nonvolatile. Location of mixing operations and finishing stations is no longer a problem

PAINTS that do not contain inflammable thinners are being used to coat automotive parts at the Dearborn plant of Ford Motor Co.

One of the main advantages of these water emulsion coatings is that they eliminate fire hazards. The same property allows a substantial reduction in application and curing equipment. Mixing operations and finishing stations may be placed at any convenient location in the plant.

"The new nonsolvent paint is an important milestone in the automobile industry since it contributes to safer employee working conditions," says D. J. Davis, vice president of manufacturing at Ford.

Here are some more advantages of the new paint:

- Its corrosion resistance can be built into the binder material.
- Its evaporation losses are low.
- It has good adhesion to metal, and some types have improved drying characteristics.
- It provides more film coverage per gallon since it can be applied at high solid concentrations.
- It provides the correct film thickness with less paint.

How It's Made—Inflammable thinners are eliminated by suspending particles of pigment in water to form an emulsion. This eliminates dissolving the pigment in volatile thinner.

The emulsion is a mixture of a binding material with the necessary pigments and colloids, or dispersing agents. The emulsified binder is an intimate mixture of a water-in-soluble oil, resin or latex component and the water component or carrying medium.

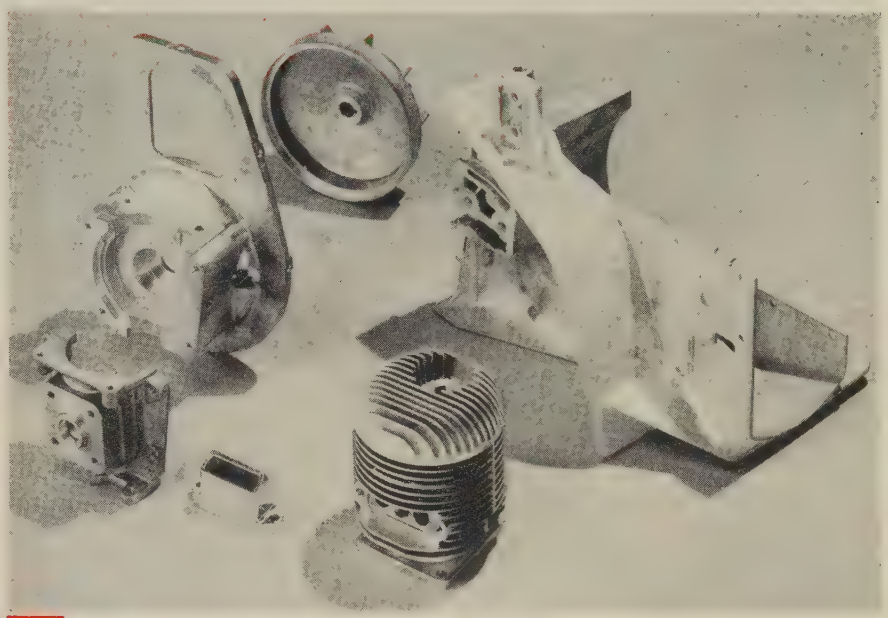
Emulsifying agents, antifoaming ingredients and other additives are brought together in proper balance with the binder and water vehicle to produce the finished emulsion coating.

Extensive research was required to perfect a product with exterior durability and adaptability to high volume production.

Suppliers—Glidden Co., Cleveland, is typical of suppliers who developed the new product. A. D. Duncan, Glidden vice president and general manager of the paint division, points out: "A principal advantage inherent in an emulsion coating is that it can be 'tailor made'—formulated and marketed to achieve specific end results as required by the consumer."

Look Ahead — Research efforts are being concentrated on better finish coat properties. Mr. Duncan stated: "Glidden foresees when appliance manufacturers and other metal fabricators will use emulsion as finish coats for their products."

Look to Aluminum Diecastings when parts must be . . .



1 **LIGHT AND STRONG** . . . These castings add strength and lightness to a portable chain saw made by Porter-Cable Machine Co., Syracuse, N. Y.

ARE YOU using more diecastings? Many companies are; accompanying illustrations suggest why.

Aluminum diecasting is highlighted in this article because of its amazing growth. In 1946, its volume was less than half that of sand or permanent mold aluminum casting. In 1952, it passed sand casting and in 1953 permanent mold. This year's production bids to exceed 4 million lb and equal total output of both methods.

Reasons for Growth — Higher labor costs (in assembling and machining) have sparked the increasing use of aluminum diecastings. Aluminum Co. of America, Pittsburgh, points out that they are being used for many structural parts. Just a few years ago, they were used mostly as shrouds or covers.

Quality and soundness have been greatly improved by higher locking and injection pressures. The strength and pressure resistance of diecastings are provided by their dense outside skin. High pressures increase the density and thickness of this outside layer.

Ten years ago, only big machines had locking pressures of 250 tons; today, such pressures are used only on small machines. Injection pressures of 5000 psi are common. In some cases, they have reached 20,000 psi, says Alfred F. Bauer, assistant general manager and chief engineer, Doehler-Jarvis Division, National Lead Co., Toledo, O.

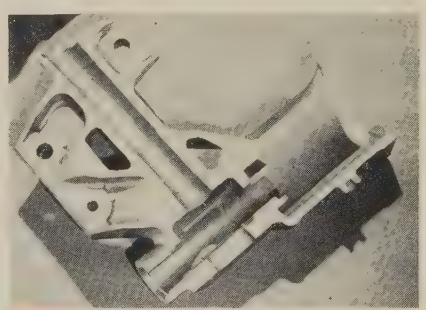
Huge Machines—At least three companies have made diecasting machines with capacities in excess of 1200 tons. Demand for these machines was set off when the automotive industry switched to aluminum diecastings for torque converter housings.

Doehler-Jarvis' biggest machine has a locking pressure of 2000 tons and can cast aluminum parts weighing up to 75 lb. The company says it can cast V-8 engine blocks in addition to the 6-cylinder block produced experimentally.

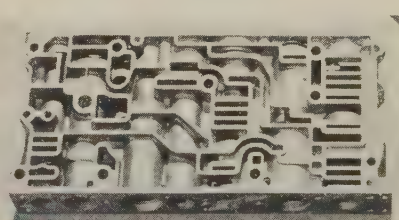
V-8 Block—Mr. Bauer states interest in the diecast block has never been as strong as now. Engineering problems are solved and design is in the cost analysis stage. He predicts it will be at least three to four years before the first diecast V-8 engine blocks appear.

One auto maker is rumored to be ordering six 2500-ton machines for a diecasting plant to be located adjacent to a hot metal source for aluminum. It will be ready in 1959.

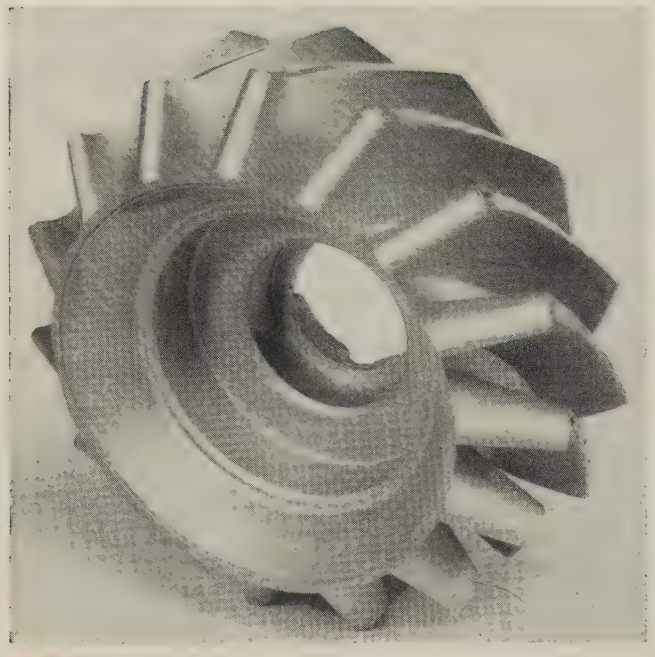
More Predictions—Diecast aluminum wheels (with gray iron brakedrum inserts) are scheduled



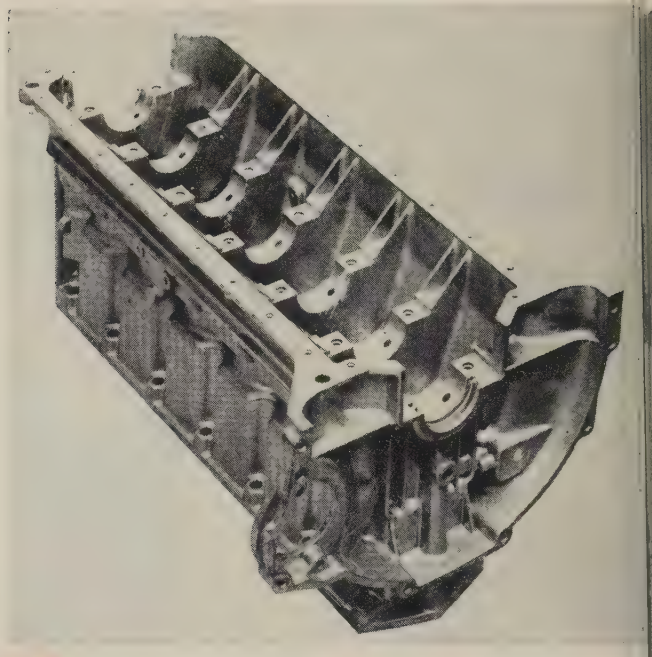
2 **PRESSURE TIGHT** . . . High density on this 5-lb steering housing is achieved by use of a shot control system and injection pressures of 6500 psi. Casting withstands 1100 psi internal pressure and high stress loads



3 **INTRICATE** . . . Better alloys and diecasting dies (and the use of intersecting cores) make the diecasting of this 2½-lb valve body possible



4 **COMPLEX . . .** This is a diecasting. Special dies make it easy to produce the complex curves and undercuts on this part for automatic transmissions



5 **BIG . . .** This six-cylinder engine block weighs 43 lb. All 147 holes are cored. Problems on V-8 blocks are solved; diecast blocks may appear in 1961 cars

for introduction on the 1958 cars. They will appear in one, perhaps two, luxury jobs.

The inner frame of auto doors may be a diecasting on some of the 1959 models.

Big Possibilities—The introduction of vacuum diecasting of aluminum promises to give an additional boost to sales. One substantial reason is that the castings can be given an attractively anodized finish.

David Morgenstern, president, Nelmor Mfg. Corp., Euclid, O., (developer of the patented Vacucast process and builder of conversion equipment for existing machines), predicts that anodized castings will decorate 1960 cars. Presently, parts with a wall thickness of 0.090 in. can be anodized. Reduction of the thickness to 0.060 in. appears promising, he says.

The potential includes automotive hardware (such as grilles and trim), appliances, office furniture and household goods.

Opinion is divided on the extent vacuum diecasting will supplant conventional methods. Douglas Eaton, sales manager, Vacucast Division, Reed-Prentice Corp., Worcester, Mass., believes all aluminum castings can be made better or faster with vacuum. (His firm is the exclusive builder of machines using the Nelmor process.)

Others believe the system will extend the range of jobs which can be diecast and take over some that are hard to make with the conventional process.

Benefits of Vacuum — Thinner sections, denser castings and less scrap are among the advantages claimed.

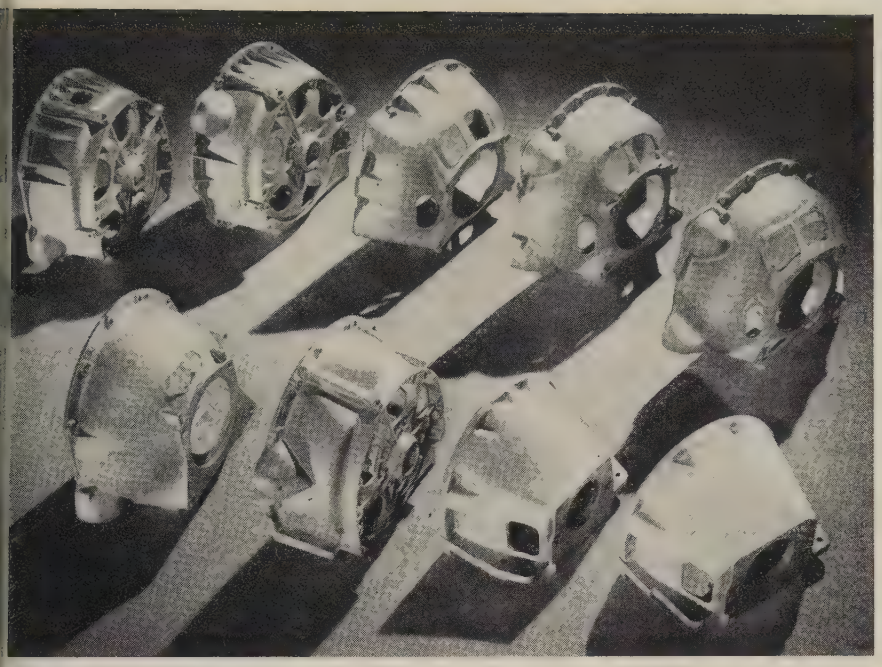
Mr. Eaton says the machines can handle alloys that have a 50°F range of fluidity. Metal is transferred automatically from furnace to machine in ½ to 3 seconds.

Zinc—This was the first metal to be vacuum diecast. Nelmor estimates 60 different zinc parts have been made by its process since it was introduced three years ago.

Cosma Testing Laboratories, Cleveland, reports that tests show a void-free skin section 0.02 in. thicker than that of the same parts made without vacuum. Other advantages: Smaller and fewer voids; improved bending strength; and 19 per cent greater tensile strength.

The potential for zinc vacuum casting, says Mr. Eaton, is in: Plated parts; jobs where porosity is a problem; parts that require

6 **COLORED . . .** Vacuum diecasting makes it possible to use aluminum alloys which can be decoratively anodized. Possibility: License plate frames



BIG POTENTIAL—These torque converters and clutch housings weigh 8 to 16 lb. These and similar designs (some of which combine the transmission case and bell housing in one casting) may boost the production of aluminum diecastings 30 million lb a year

balancing; castings that require baked-on finishes or are heated.

H. E. White, president, Cleveland Hardware & Forging Co., Cleveland, says: "With vacuum you can reduce wall thickness and get good diecastings with good surface finish. It offers the ultimate in lightness, plating surface and soundness."

Wall thicknesses on some zinc parts have been reduced 40 per cent or more. A mask for a portable TV set was made so thin that it weighed less than the aluminum design originally considered.

Mr. White says that the vacuum makes it easier to run adjacent thick and thin walls. With a vacuum, 0.060 in. walls are common and 0.030 to 0.040 in. walls possible. Cleveland Hardware has diecast an experimental cup-shaped zinc part 0.020-in. thick.

Lower injection pressures are possible—in some cases 10 per cent less; in others, 40 to 50 per cent less.

Vacuum helps in making long thin parts. Mr. White looks for them to compete with stampings for such designs.

How Fast—Production rates are comparable to those of conventional machines, says Cleveland Hardware. Difficult jobs can be run faster. Cleveland Hardware can make about 250 vacuum cycles an hour with a 50 cu-ft accumulator tank and a 15-hp motor. When another machine is installed, the two accumulator tanks will be interconnected to get a more complete vacuum than the present 20 in. of mercury.

Case History—One auto maker compared vacuum with conventional diecasting in the production of a zinc trim part. It was made on a 1000-ton machine and weighed 13 lb as cast, 8 lb after trimming. Production rate (73 an hour) is about the same on both machines, but vacuum production is expected to improve.

With the conventional machine, scrap came to 18 per cent. Vacuum cut it to 6 per cent. Shot pressure was 1500 psi on the conventional machine, 700 psi on the vacuum unit. Yearly net savings are estimated at $4500.

More Machines — Eighteen vacuum machines are producing zinc parts; a couple are doing experimental work on aluminum; and Reed-Prentice is building a number of 400 and 600 ton vacuum machines. The firm says that the 400 tonners will have the capacity to make 12-lb zinc castings with a finish suitable for plating. Generally, metal pressure will be as low as 1200 psi.

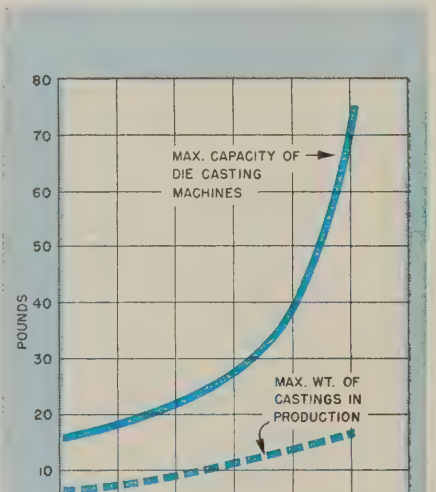
Two companies plan to use the process on brass, and possibilities for use with magnesium look good.

Systems — Reed-Prentice machines obtain their vacuum by enclosing the platen area of the machine in a hood. Aurora Metal Co., Aurora, Ill., encloses the die in a housing to cast aluminum bronze and silicon bronze alloys. Other vacuum methods for cold chamber machines are being developed.

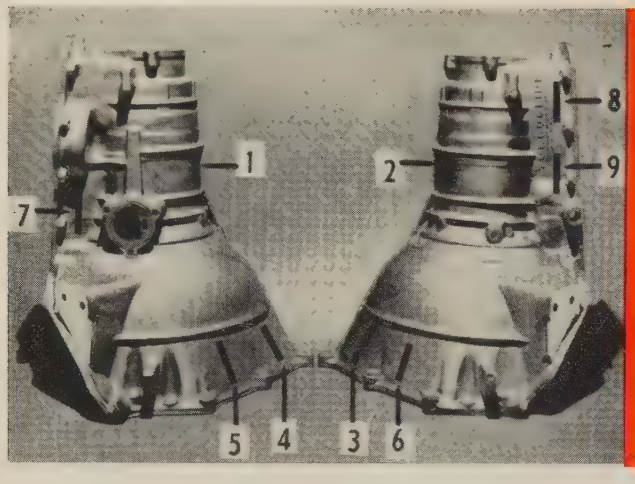
Other Advances—The trend to large diecastings has spurred development of automatic ladling devices. Lindberg-Fisher Division, Lindberg Engineering Co., Chicago, makes a unit that delivers shots of up to 30 lb of aluminum.

Ajax Engineering Corp., Trenton, N. J., says 120 of its automatic pouring units for cold chamber machines are in operation. Recently, units were made to produce castings up to 40 lb.

National Carbon Co., New York, has developed a mold release agent that coats the die steel with a fine film of boron nitride and protects



ROOM TO GROW— Diecasters and the makers of machines have consistently stayed ahead of industry's demand for larger and larger castings



Ultimate Tensile Strength		
Production Check Test Bar	psi	% of Max. Value
1	30,530	75
2	30,606	75
3	30,240	74.5
4	32,720	79.5
5	28,918	70.5
6	31,622	77.5
7	30,414	75
8	31,325	76.5
9	28,665	70

Source: Doehler-Jarvis Division, National Lead Co.

CASTINGS CARRY THE LOAD—Quality of highly stressed parts can be controlled so that test bars machined from them will have at least 70 per cent of maximum strength obtained on separately cast test bars

Case history of a midwestern automotive supplier: After automatic buffing, 80 per cent of these zinc diecastings had to be hand buffed. Major cause: Poor as-cast surfaces. Vacuum diecasting reduced the extra work to 20 per cent. Major cause: Handling marks. Finishing costs were cut 4½ to 5 cents per piece.

it from soldering. Excellent results have been obtained on many zinc dies and on some aluminum dies.

Alcoa has developed a high-density casting method for small chunky parts. Soundness nearly equals that of wrought materials.

More Trends—Along with the increased demand for large machines an interest in small ones for jobs requiring accuracy and high production has developed. Cast Master Inc., Bedford, O., has developed a 75-ton unit for zinc that can make 700 to 800 shots an hour. It can cycle 1300 times an hour.

Some diecasters find the use of inserts is becoming more common. Others have been able to avoid increasing the use of inserts because of the improved properties of alloys.

Apex Smelting Co., Cleveland, reports growing sales of an alloy with 2 to 2.5 per cent zinc which, it says, has better machinability than the SC84A alloy and about equal castability. Tests have shown that zinc contents up to nearly 3 per cent will not affect corrosion resistance.

More engineering is required for the dies used in producing large castings. Careful attention must be given to the basic parting line, gating and venting, core pull arrangements, overflows and flash control. The expected filling time is used to compute gate sizes.

Cost Angles—The American Die Casting Institute Inc., New York, says new standards enable buyers to specify tolerances more intelligently and cut costs.

One auto maker is putting an aluminum diecasting plant next to its machining line. Ingot will come in one end and machined castings out the other. This represents the final step in direction many companies have taken.

The Question—On make or buy the American Die Casting Institute says: "It is significant that the great bulk of diecasting production in the U.S. remains in the hands of the custom diecasting industry."

Car manufacturers who operate their own diecasting plants (and represent the bulk of captive output) often buy more diecastings than they make, reports the institute.

Donald L. Colwell, director of laboratories, Apex Smelting Co., thinks that the trend for end product companies to make their own diecastings is coming to an end. He believes that when all overhead costs are properly figured, it is cheaper for job shops to do the work. Reasons: "Diecasting is still an art; experience is all important. And the jobbing diecasting shop has the most experience by far."

There is another reason favoring the jobbing diecaster. When production of the end product maker goes down, the overhead on his diecasting machines goes on. The job shop operator stands a better chance of keeping his machines busy.

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service,* STEEL, *Penton Bldg., Cleveland 13, O.*

What Douglas Saved in FORMING

Operation	Metal	Conventional Method	Subzero Method	SAVINGS
Pressure Forming (Verson-Wheelon)	Aluminum	75% of parts formed in SO condition	75% of parts formed in SW condition	463 hr a week
Drop Hammer	Aluminum	0.2 hr per part	0.15 hr per part	0.05 hr per part
Power Brake	Aluminum	0.5 hr per part 40% scrap	0.3 hr per part No scrap	0.2 hr per part 100%
Stretch Press	Aluminum	50% scrap	No scrap	100%
Check & Straighten (hand operation)		11 hr (avg) per part	7 hr (avg) per part	4 hr (avg) per part

What Douglas Saved in MACHINING

Radial Routing	Aluminum	0.036 hr per part Deburr—0.079 hr	0.028 hr per part None	0.008 hr per part 0.079 hr per part
Radial Routing	Steel	0.571 hr per part	0.226 hr per part	0.226 hr per part
Radial Routing	Phenolic	Wear: two parts	75 parts	73 parts
Band Sawing	Steel	0.571 hr per part	0.286 hr per part	0.285 hr per part
Band Sawing	Titanium	Three parts per blade	Nine parts per blade	300% improvement
Spotwelding	Aluminum Steel	Normal shear strength	Improved shear strength	Increase 100 to 300 lb per spot
Gang Milling	4340 C.M. (forging)	Feed: ¾-in. per minute Rpm: 20 Surface: 60 fpm Load: 0.003 in. per tooth Wear: 65 parts	5 in. per minute 20 60 0.020 in. per tooth 169 parts	4¼-in. per minute Same Same 600% improvement 260% improvement

Cold Treatment Ups Workability

Subzero coolant speeds cuts in tough metals like AISI 4130. Tools last up to five times longer. It prolongs SW ductility of aluminum alloys, cuts rework 75 per cent

SUPERCOLD liquids (— 40°F quenchants, coolants and cutting fluids) greatly improve machinability and formability, says Douglas Aircraft Co. Inc., Santa Monica, Calif.

Here are some of the benefits it gets in working with aluminum, steel, titanium, stainless and phenolics:

- Aluminum forming is easier. (Because quick-frozen metal stays ductile longer, one department estimates its annual savings at 24,085 hours. Distortion and warping are also noticeably reduced).
- Metals machine faster. (With supercoolants, time improvements range from 25 to as much as 600 per cent.)
- Tools last longer. (With supercoolants, a high-speed milling cutter that normally handles only three pieces of AISI 4140 has finished up to 51.)
- Machined finishes are better. (Using supercoolants, you can turn a 20 microinch rms finish on AISI 4340 which has been heat treated to 280,000 psi.)

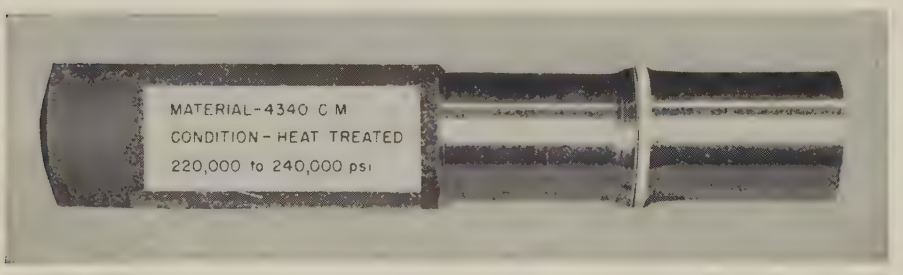
Forming—Precipitation hardening aluminum alloys temporarily retain their softness after quenching. At room temperature, the metal becomes fully hard in a short time. To prolong the ductile phase, aircraft firms hold quenched parts in deep-freeze cabinets until they are needed.

Parts ordinarily won't cool fast enough in the deep freeze to prevent partial age hardening. They harden more during forming, which increases splitting, cracking and warping.

Here's how Douglas solves the problem: Parts are quenched in refrigerated water and transferred immediately to a liquid bath kept between — 40 and — 50°F. Rapid cooling improves and prolongs the ductile phase. It eliminates more

Supercoolant flows directly on cutters and work. Inclined aluminum pan is insulated from machine table. Pump circulates solution of trichlorethylene and Stoddard solvent through refrigeration unit

Phenolic sheet at the left has been routed at normal feeds and speeds. One at right was cut with a supercoolant. Speed, ease of cutting and complete absence of burr are outstanding results



This bar of 4340 chrome-molybdenum steel was turned on an engine lathe equipped with the supercoolant. Cuts were made with different tool bits. Finish at center is exceptional

than 75 per cent of the rework formerly required.

The bath is a combination of trichlorethylene and Stoddard solvent. It remains fluid at low temperatures, is nontoxic and doesn't react with metals.

Machining — Douglas experimented with the solution as a coolant for machining operations. Tool life increased, machining time decreased and finishes improved.

Formed steel parts (3/16-in. thick 4130) were subzero quenched before band sawing. Trimming time was cut in half; blade life increased 300 per cent; there was no evidence of work hardening on the sawed edge.

A 4340 C.M. steel bar, heat treated to 240,000 psi, was cut on a lathe with supercoolant. Cuts 0.020 to 0.040 in. deep with a D-6-1 Carboloy tip were made without difficulty or apparent wear of tool edge.

In one test, a 0.063 in. cut was made on a 4340 C.M. steel bar heat treated to 280,000. Speed was increased from 50 to 345 rpm with no tearing or apparent damage to the tool. (Tool life normally is short.)

In another department, both 18-8 fully hard stainless steel and AMS 4925 titanium were routed with the same success.

Plastics, Too—Even phenolics respond well to the cold treatment. Douglas routed a piece of ½-in. laminate and cooled the cutter with the cold solution. "The parts cut almost like butter."

Routing time was reduced 50 per cent. No deburring or polishing were required. Cutter life was greatly improved (see chart page 93).

Variation of Theme—The firm's engineers also developed a stabilizing treatment for aluminum forgings and bars which cuts warping caused by machining.

Stock in either the heat treated or T-6 condition is immersed in a − 100°F bath, then plunged into boiling water.

The treatment is said to stabilize the metal sufficiently to reduce or eliminate distortion from machining.

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service,* STEEL, *Penton Bldg., Cleveland 13, O.*

MATCHLESS STEAM HOSE

Keeping a raging killer under control

Scalding steam is a powerful work-saving servant—but let it get out of hand and it can mean sudden death. Yet this valuable, though unruly demon is tamed by a hose that is *absolutely safe*—U. S. Matchless® Steam Hose. This hose cannot burst—even with steam pressures up to 200 pounds. After long, safe service—far longer than ordinary steam hose—the wall structure, instead of bursting, allows a trickle of steam to merely *leak* through—reducing the pressure and giving plenty of notice that a replacement is finally needed. Safety councils give U. S. Matchless their full approval.

U. S. Matchless Steam Hose is used in steam lines in every kind of industry. For such a husky hose, it is extremely flexible and easy to handle. The tube is made of specially compounded stock to provide high resistance to heat; the carcass is of braided mild steel wire to give outstanding strength, flexibility and ductility; a synthetic rubber cover resists heat, oil and weather.

U. S. Matchless Steam Hose is obtainable at any of the 28 "U. S." District Sales Offices, at selected distributors, or write us at Rockefeller Center, New York 20, N. Y.

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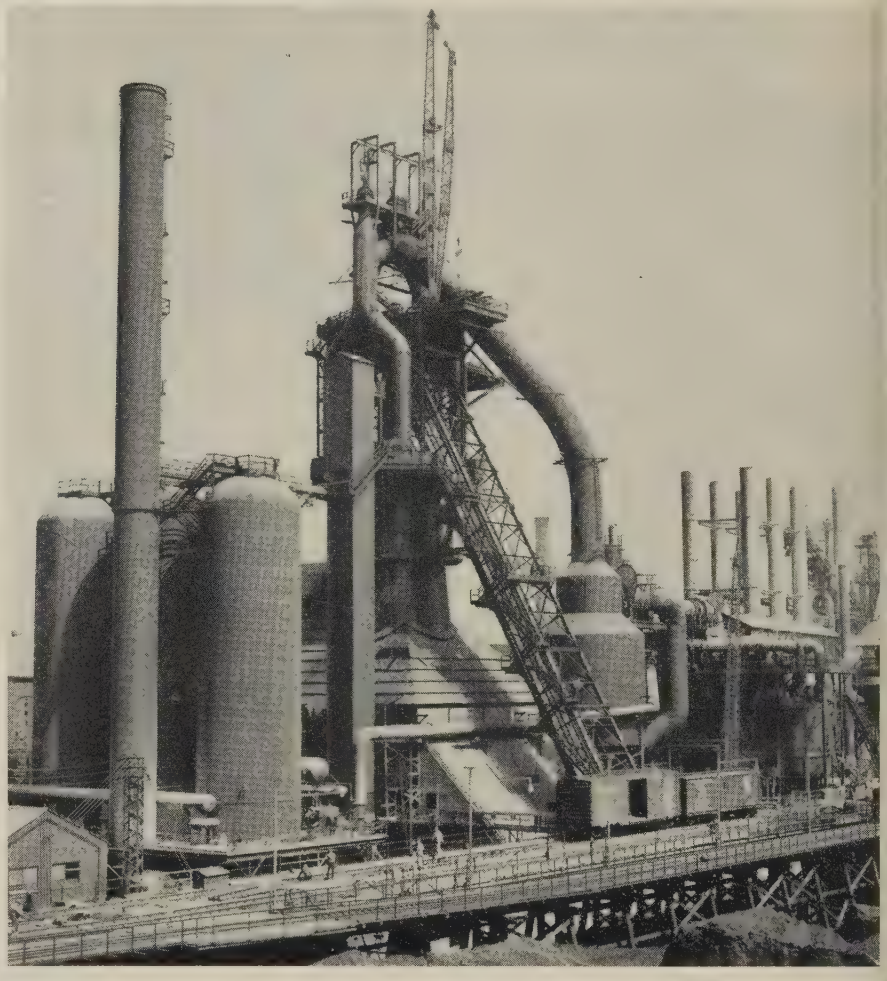
See things you never saw before. Visit U. S. Rubber's New Exhibit Hall, Rockefeller Center, N.Y.

Interest in beneficiation highlights importance of this phase of blast furnace operations today. Other phases appeared in STEEL last week

By CHARLES E. AGNEW
Consultant
Blast Furnace & Sintering Plant Operations
Cleveland



No. 5 stack of the American Steel & Wire Division at Central Furnaces & Docks, Cleveland, which has a daily capacity of 1350 tons of iron

Maintenance of Equilibrium In Blast Furnace Operation

PART II

EVERY experienced blast furnace operator is familiar with the conditions of the blow-in period. After the furnace is lighted, the blowing rate and burden weight are held down while the brickwork of the furnace hearth and lining absorb heat to saturation. For a short period thereafter, the blowing rate and burden weight can be increased gradually until a critical state of mechanical equilibrium is reached, beyond which the dual increases cannot be continued without disrupting furnace operation.

Progressive increases in burden weight produce a progressive increase in pressure resistance to gas passage through interstices of the stock column. Compression causes reduction of gas volume in proportion to the amount of pressure resistance which develops. But with decreased gas volume, there is a proportionate increase in gas velocity through the channels of least resistance in the stock column due to the increase in pressure.

Next Stage—During the period

Table III—Consumption of Heat Units by Processing Divisions

	South	North	East
Btu consumed	%	%	%
Fusion temperature:			
Below	54.03	56.44	29.29
Above	45.97	43.56	70.71
Ratio	Below/Above	Below/Above	Below/Above
Heat consumption	1.17:1.00	1.29:1.00	0.41:1.00
Processing capacity	0.85:1.00	0.77:1.00	2.41:1.00
	−0.15	−0.23	+1.41

of approach to the critical stage of equilibrium, the space occupied by solid burden materials is gradually increased while that occupied by gas is gradually reduced. The critical relation of space occupancy may be described as the condition where the velocity of gas due to compression has greater effect upon the mechanical action of stock and gas flow than weight of stock has upon compression of gas volume.

With attainment in the space equilibrium, the effect upon flow and counterflow of solid and gaseous matter is reflected in the lifting power of gas velocity versus the force of gravity exerted on solid materials of the burden. If an attempt is made to increase the burden weight after the critical state of space equilibrium has been reached, the A quantity becomes A+ with either arrangement of processing division dimensions (see illustration, STEEL, July 29, p. 120), and there would be:

$$A+ + B = C+$$

Since C represents the total displacement of space available for the preparation processing activity, there is no room for the plus quantity which has been added to A. Mechanical equilibrium in the preparation for smelting division of processing would be destroyed. Inevitably, the overload of burden would cause an increase in the gas velocity beyond the narrow range of near perfection in space equilibrium and gas would spasmodically blow through the upper section of the stock column. The furnace then slips, rolls, or dusts. If such a condition is not corrected immediately, control of the furnace operation will be lost.

How To—The cure is effected through the restoration of the burden weight to the original A quantity, or less, and the reduction of the B quantity to B minus (reduction of gas volume through the reduction of blast volume) until conditions of gas and stock flow permit the restoration of normal equilibrium between the A and B quantities.

If the blowing rate is increased above the normal equilibrium rate in an effort to increase iron production by increasing the stock travel rate through the furnace, the B quantity of the equation becomes B plus, and there would be:

$$A + B+ = C+$$

The effect upon the mechanical equilibrium would be the same as when a plus quantity is added to the A quantity.

It is common knowledge that a fast blowing rate forces the use of a relatively light burden. A slow blowing rate permits the use of a heavier burden. With such adjustments, the equation would read:

$$A- + B+ = C, \text{ or}$$
$$A+ + B- = C$$

Since plus or minus quantity is equalized in effect by a quantity of opposite value in either case, the equilibrium in mechanical activity can be maintained with either arrangement of A and B quantities.

Blast Temperature — Deficiency in the capacity to prepare stock for smelting in relation to the capacity to smelt stock places a definite limitation upon the temperature of the blast which can be used. Thermal requirements for the smelting division of processing are determined by the mineral composition of the slag and by the chemical composition specified for the iron product. Sensible heat in the smelting division of processing in excess of smelting requirements will be reflected two ways: 1. Chemical composition of the iron product cannot be held to specification. 2. Mechanical equilibrium in the gas and stock flow between divisions of processing cannot be maintained.

Heat is energy, but it does not occupy space. But a plus value added to the Y quantity of the smelting division equation will be reflected in the X quantity. The equation may be written:

$$X + Y+ = Z+ \quad \text{or}$$
$$X+ + Y = Z+$$

With an increase in the Y quantity, the gas leaving the upper section of the smelting division of processing will be increased in volume and/or velocity. Such condition would cause a plus quantity to be added to the B quantity of the preparation for smelting equation. The combined effect of the increase in the Y quantity would be:

Smelting preparation $A + B+ = C+$

Smelting $X + Y+ = Z+$

Since CZ equals the total displacement of space within the furnace, mechanical equilibrium within each division of processing, as well as between divisions, would be destroyed by the plus quantities. Control of the furnace operation would be lost.

Relationships — As described, mechanical equilibrium in processing activity cannot be maintained with continuous addition of plus quantities; there must always be a compensating minus quantity to equalize the effect from a plus quantity, or vice versa.

Because there will always be some degree of variation in the properties of burden materials (even those of the same general class) and in the properties of natural air, the equilibrium in processing activity never is maintained to perfection continuously. The consistency of the relationship between plus and minus quantities of processing activity

Table IV—Consistency of Relationship Between Plus and Minus Quantities

	South	North	East
Ratio, total burden:coke	2.20:1.00	2.91:1.00	3.00:1.00
Lb gas/gross ton iron	13,804	9,962	6,728
In relation to South:			
Burden, %	.....	+32.2	+36.3
Gas, %	.....	−27.8	−51.2
In relation to North:			
Burden, %	.....	.....	+ 0.03
Gas, %	.....	.....	−32.4

(regardless of the class of burden materials used), is illustrated in Table 4, with data from the three furnace operations in Table 2 (STEEL, July 29, p. 123).

Weights—With an increase in burden weight, there is a decrease in gas weight. The wider range in burden and gas weights between South and East operations compared to a like range between South and North operations. The far greater range between the weights of burden and gas at North and East are caused by a difference in the chemical composition of the burden materials, but the plus and minus relationships are consistent.

A change in the A quantity of the preparation for smelting equilibrium equation is always restricted to a change in the weight of the burden charged into the top of the furnace. A change in the B quantity is affected by a change in the volume of air blast entering the tuyeres, the temperature in the smelting division of processing and the amount of volatile matter evolved from the burden materials. A furnace will refuse to "take" even a few points of burden increase, or a 1000 cfm increase in blast, above the normal maximum. This fact sustains the earlier statement that the ratio of processing capacity between division of processing may exist in a wide range, but the equilibrium in processing activity must be maintained within a narrow range.

Equilibrium — Temperature is concentrated heat volume. In the study of blast furnace thermal requirements, heat volume must be the basic consideration.

Every chemical reaction will evolve or consume a fixed amount of heat, and the flow of heat will be reversed with the reversion of the reaction. Every reaction has a certain temperature requirement for its initiation, but there can be a vast difference in the volume of heat consumed or evolved by reactions effected at like temperatures. Examples are brought to light in an extract from this heat balance calculation:

Sensible Heat Carried Off		
By:	°F	Btu Consumed
Top gas (dry)	335	81.8/lb gas
H_2O in top gas	335	1166.0/lb H_2O
Slag	2568	840.0/lb slag
Iron	2525	485.0/lb iron

Maintenance of equilibrium in thermal activity resolves itself into a problem of equitable division of heat between divisions of processing—as determined by the chemical composition of raw materials used and the thermal requirements created.

Thermal equilibrium equations:
Let CZ=Processing capacity of the combined division of processing.
Preparation for smelting:
Let A=Heat volume (Btu) requirements. (Evolution of volatile matter from stock, heating residual solids to their fusing temperatures, maintaining top gas temperature above the dew point of water vapor entrained with top gas.)
Let B=Heat volume proportionate to requirements.
Let C=Processing capacity of the division. Equation, A+B=C
Smelting:
Let X=Heat volume requirements, (Consumed by smelting zone reactions, supplied to preparation for smelting division of processing.)
Let Y=Heat volume proportionate to requirements.
Let Z=Processing capacity of the division. Equation, X+Y=Z
Combined divisions of processing:
Equation, C+Z=CZ

The mechanical equilibrium equations showed that effects from changes in plus or minus quantities must be compensated for with quantities of opposite value to maintain equilibrium. In the thermal equilibrium, any change in plus or minus quantities must be supported with quantities having like value.

Heat Volume — The thermal work capacity of the divisions of processing is attainable only when heat volume is supplied in amounts proportionate to the requirements of stock being processed. Heat balance data of Table 2 illustrate this. They show the great range consumed in the production of a given weight of iron. At the same time, equilibrium in thermal work can be maintained through the equitable division of heat between divisions of processing.

Differences in chemical composition of raw materials processed and the composition specified for the iron product explain the difference in total heat volumes required for the three operations in Table 2; consumption of heat in the divisions of processing explains the need for equitable division of total volumes.

Equitable division of heat between divisions of processing is effected through an adjustment

Annealing Symposium Planned

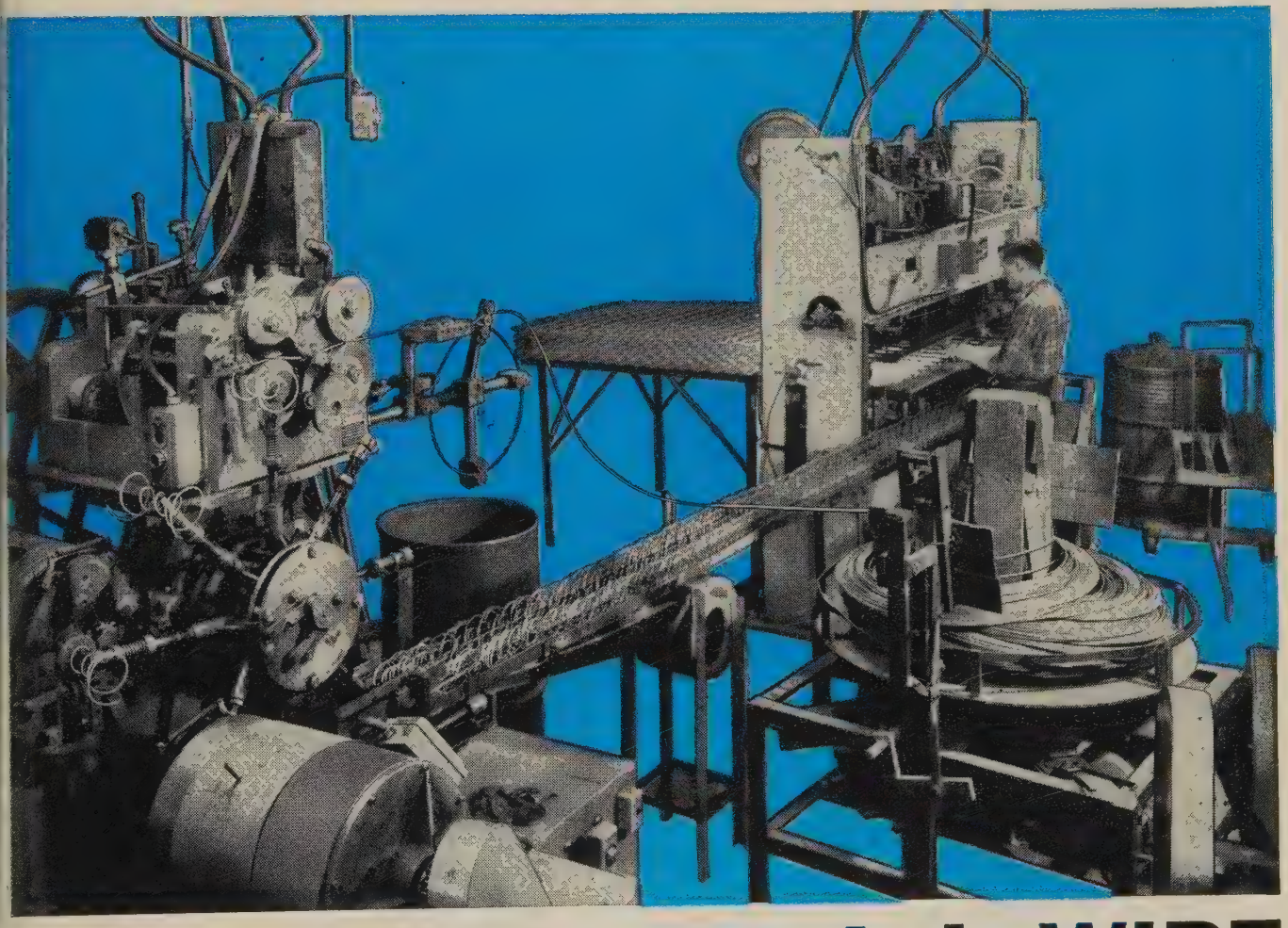
World authorities on steelmaking will meet at Case Institute of Technology, Cleveland, Oct. 29-30, for the first International Symposium on the Annealing of Low Carbon Steel. It is being sponsored by Case Institute and Lee Wilson Engineering Co. Inc., Cleveland.

Purpose of the session, says Dr. T. Keith Glennan, president of Case Institute, is to critically review the status of the process. Industrial demands for high quality, inexpensive sheet steel have emphasized the need for optimum efficiency in annealing.

Lee Wilson, chairman of the sponsoring company, who recently toured Russian and European steelmaking facilities, explains: The world's large steel producers are vitally interested in modern annealing techniques to provide greater quality control of low carbon and alloy steels.

Basic principles of annealing will be discussed Tuesday morning, Oct. 29. Attention will be centered on operational variables in the afternoon, and a round table discussion on performance criteria will be held in the evening. On Wednesday, the symposium will open with a session on operating techniques. Economics of annealing will dominate the afternoon meeting. Attendance is by invitation, but requests will be considered. Contact: Case Institute of Technology, Cleveland 6, O.

Double cone springs are produced automatically on this Wunderlich special high speed automatic coiling and knotting machine at the Sealy Mattress Company, Cleveland, Ohio. Machine coils, crimps, knots and heat treats springs made from 13½ gage Mastercraft spring wire, supplied in 600 lb. bundles.



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J&L spring wire reduces number of rejects, increases production, in modern automatic operations. One reason is that every bundle of spring wire is produced to closely controlled tolerances.

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PROGRESS . . .

in the blowing rate and the temperature of blast.

The volume of heat available for delivery to the preparation for smelting division is determined by that available in the smelting division which is in excess of its requirements. Obviously, heat in sufficient volume (the Y quantity of the smelting division thermal equation) and at sufficient temperature (concentrated heat volume) must be maintained in the smelting division to meet its requirements. Otherwise, the furnace cannot be operated.

One Requirement — Supplying heat to the preparation for smelting division is one of the smelting division requirements (part of the X quantity of the smelting division thermal equation).

Heat in the smelting division which will satisfy requirements of the preparation for smelting division without being detrimental to the smelting division constitutes maintenance of thermal equilibrium in the smelting division and between divisions.

Take furnaces with processing capacity ratios similar to those of the South and North operations of Table 2. The heat in the preparation for smelting division of processing in excess of the B quantity of the preparation division thermal equation will be directly reflected in violent disturbances in the mechanical equilibrium of stock and gas flow through the division. Indirectly, there will be excessive pressure resistance to the entry of blast at the tuyeres.

Consider furnaces with a processing ratio similar to that of the East operation of Table 2. Heat in excess of the B quantity will be reflected in: 1. An increased depth of the initial fusion zone to the extent of fusing a ring on the inwalls of the furnace. 2. Thereafter, a violent disturbance to the mechanical equilibrium of the stock and gas flow through the division.

After the permissible blowing rate for the class of materials being processed has been established, adjustment in blast temperature is commonly used to maintain thermal equilibrium within the practical range of near perfection.

Tight Furnace—Take a look at South and North in Table 2. In

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OPEN TYPE COAL AND ORE GRAB BUCKETS CARRY BRIMMING PAYLOADS...

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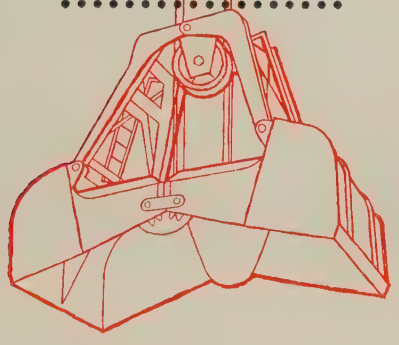

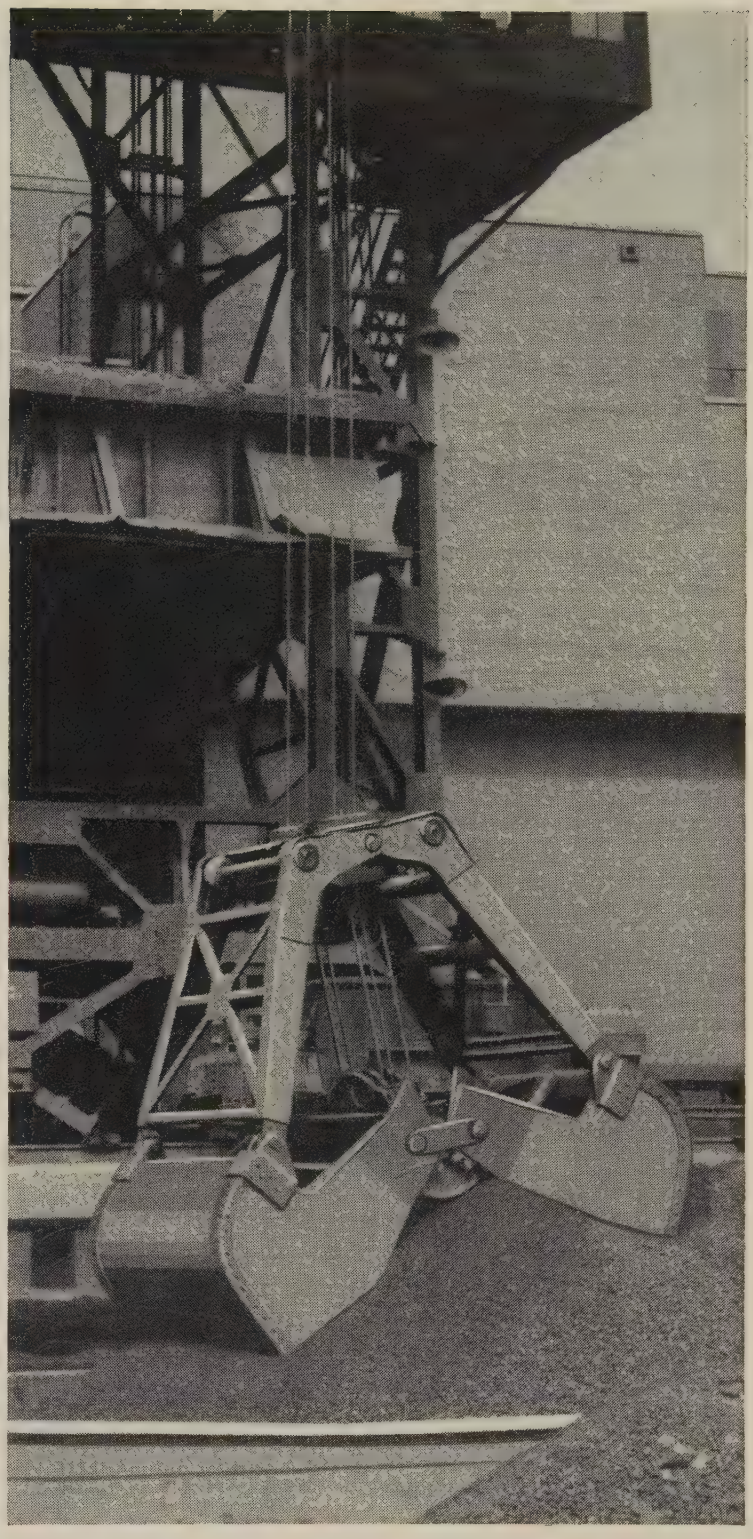

Built to the same rigid standards of quality as are all INDUSTRIAL BROWNHOIST machines, these open-type coal and open-type ore buckets are designed for perfect weight distribution, to increase the payload.

Simplified construction makes upkeep simple. Annealed steel castings, alloy steel shapes and plates assure a lifetime of powerful service. I-B open-type coal grab buckets range from 84 to 480 cu. ft. capacities; ore buckets from 120 to 275 cu. ft. . . . and in custom designs where necessary for special requirements.

For further information on I-B job-engineered buckets —open type grab, link type, flush link type and clamshell—write for your copy of new catalog 574, just off the press. It gives you complete specifications on all I-B buckets and grapples, and contains many photographs of this money-making equipment at work.

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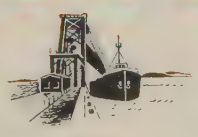
250 TON WRECKING CRANE

COAL-ORE BRIDGE



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operations where preparation for smelting and smelting capacities approach a 50:50 ratio, but are slightly deficient in preparation capacity, the narrow limitations of the near-perfection range are commonly manifested this way: Operations will "hang" easily if blast temperature is not promptly adjusted when change in thermal conditions within the furnace calls for adjustment.

In furnace operations where there is wide divergence from the 50:50 ratio and operations are deficient in smelting capacity (see East, Table 2), there will be no limit to the blast temperature which can be used so long as smelting capacity is deficient in relation to preparation for smelting capacity.

Timely—Widespread interest in the use of beneficiated raw materials revitalizes the importance of equilibrium in the processing activity to control furnace operation.

A change in raw material properties does not change operating principles, but it does require adjustment in practice. The nature of the adjustment is not determined by the will of the furnace operator but by the processing requirements of the raw materials.

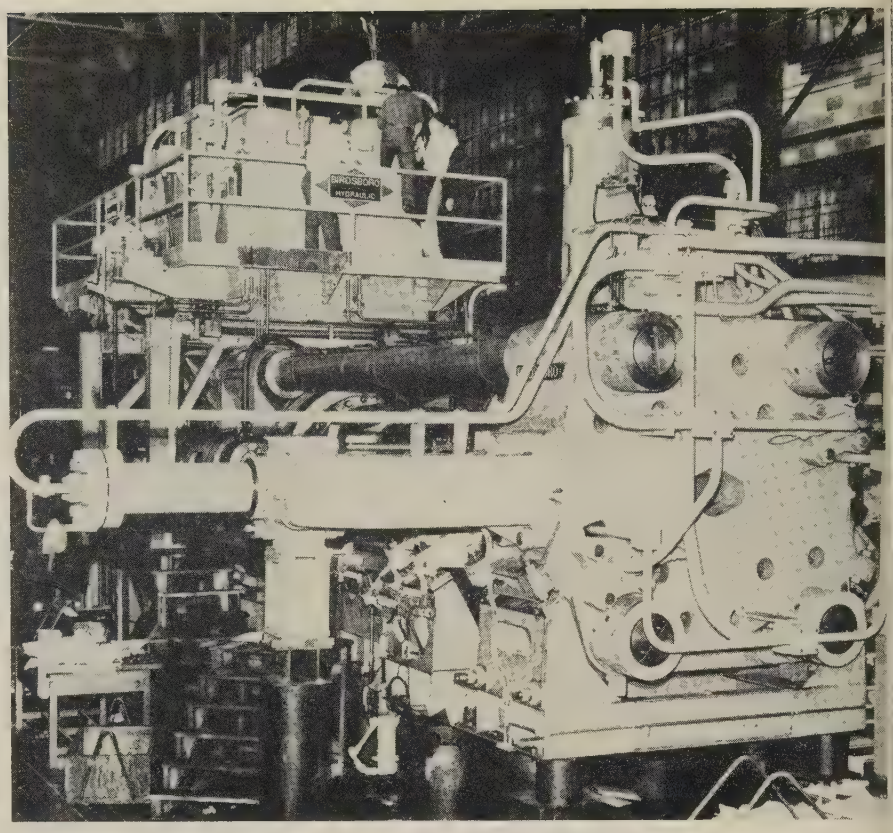
Blast furnace operating principles are best served when maximum production is obtained with minimum conversion cost. Raw materials used at the three furnace operations in Table 2 range from natural low grade to fully beneficiated high grade. Raw materials used in any furnace operation must be within the range of the Table 2 materials. The advantage of beneficiated materials to conversion economy is reflected in these fuel rates:

	South	North	East
Lb coke per gross ton	2626.85	1682.00	1350.00
Reduction from South		944.85	1276.85
Reduction from North			332.00

Evaluation of the pounds of coke saved per unit weight of iron produced indicates the desirability of beneficiation.

[1] U. S. Bureau of Mines technical paper No. 391.

• *Extra copies of this article and Part I, which appeared last week, are available until supply is exhausted. Write Editorial Service,* STEEL, *Penton Bldg., Cleveland 13, O.*



This 3000-ton extrusion press is installed at the Baltimore Division of Revere Copper & Brass Inc., Baltimore

Extrusion Press Is Versatile

Variable delivery pumps provide different extruding conditions. Dual control and three die locations help minimize down time. It can operate when one pump is down

AN aluminum extrusion press with interlocked controls provides automatic sequence cycling. Its builder: Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.

The press (its capacity is 3000 tons) extrudes aluminum sections and tubing in round, rectangular and irregular shapes.

It can be equipped to produce wide flat shapes from rectangular billets.

Regulation of the extrusion speed (0 to 42 in. a minute) is electronically signaled by a dual control. It can be controlled from the main pulpit or from a location overlooking the emerging extrusion.

Operation — Four radial piston pumps have a variable delivery rate to direct optimum quantities of oil to the press components. Pumps are driven by two 350-hp motors and can deliver up to 432 gallons of oil a minute.

The press can operate on three pumps if one needs to be repaired.

A mandrel on the end of the main ram moves into the die to form the interior shape of the extruded shape. An alternate die location permits a second die to be inserted, removed, dressed or adjusted while extrusion continues on the first die. A third position allows ejection of unextrudable billets.

The press may be jogged through one operation at a time by separate controls, or automatic sequence cycling can be used to control the complete operation.

Aluminum for Hot Uses

Powdered aluminum products that can withstand 900°F have been developed at Alcoa Research Laboratories, New Kensington, Pa.

They are available as extruded shapes, forgings, sheet, foil, drawn and extruded tubes, impact extrusions, fasteners and wire.

The metal is said to be more economical and easier to fabricate than titanium and has a higher thermal conductivity than titanium or stainless steel.

How It's Made—Each flake of a fine aluminum powder is coated with aluminum oxide. When the powder is compacted and worked, the oxide strengthens the product and gives it stability at elevated temperatures.

The powders are formed into compacts under pressure and heat. They are extruded into shapes for further fabrication.

If use requires resistance to friction, parts can be anodized. The hard oxide coating obtained prevents moving parts from sticking.

Applications—The metal is used for standard parts in a major jet aircraft engine. It is being tested for use in honeycomb sandwich structures, air-borne heat exchangers and lightweight fasteners.

Three Alloys—Domestic aluminum powders are used to make M257, and powders imported from Switzerland are used for M430 and M470.

Extruded Steel Cuts Costs

Cleveland Hard Facing Inc. is reducing time and material costs by using extruded steel tubing in the manufacture of a propane engine part. Solid bar stock was formerly used. The tubing is made of high speed steel, type SSV-54.

Using 2-in. solid bar stock, only 16 pieces an hour were cut. With the same equipment, the company now cuts about 100 pieces an hour. Metal and machining time are reduced because the extruded product has thin walls.

The company was able to increase yields up to 250 per cent (by weight.) Estimated economies: 16 per cent per ring in material cost, about 9 per cent per ring in machining time.

Special trailers transport the steel from the rolling mill

Trucks Keep Steel Moving

They carry it from the rolling mill directly to the finishing plants. It's a production line operation between plants spread over a 335-acre area

AUTOCAR trucks helped eliminate a tough handling problem at the 335-acre Cleveland Works of Jones & Laughlin Steel Corp.

For years, coils were transferred from the rolling mill to railroad cars and shipped to the finishing mills. A special transportation material handling department was set up late in 1954 to develop a continuous handling operation using trucks to provide the flexibility needed within the plant.

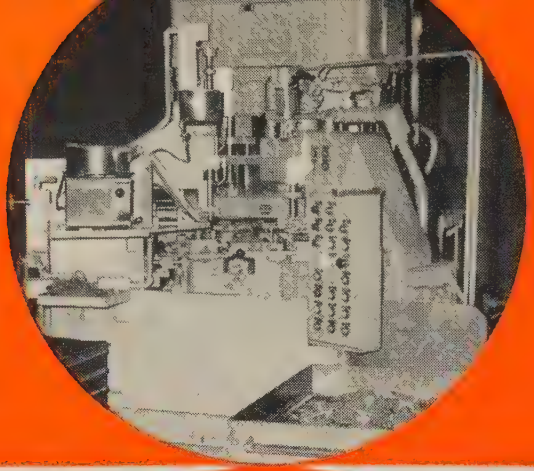
Trailer Design — Len Abrams, American Cartage Co., and Joseph P. Kalivoda, product sales engineer, Fruehauf Trailer Co., consulted on the trailer design. An inverted V-block running crosswise on the trailer bed was designed to handle the coils, which are moved from the mill to the trailer by lift truck. The Autocar tractors were made by White Motor Co., Cleveland.

The trailer is 39 ft 6 in. long to accommodate the 40-ft plate without overhang. The coil can be laid on its side and lodged in the V-block without rolling or chaining. This prevents edge damage to the coil. Original estimates called for two tractors and 15 trailers, plus one spare to handle hot shipments or emergency runs.

Benefits — Constant efforts are being made to improve the efficiency of the operation. Careful logs are kept on such things as how the equipment is being used and how much improvement in performance is made each month.

The truck fleet is readily alerted to special demands by radio control dispatching. Units anywhere in the plant area are under complete control.

Shipments go direct from the rolling mill to the finishing plant to which they are assigned. Special storage has been arranged at each plant so coils or plates can be stocked to eliminate interruptions in operating schedules.



Two sizes of motor end-plates are assembled, bored, drilled and tapped in a Natco 3-Way Machine.

At Wagner Electric Corporation

One Natco

NATCO

Assembles, Bores, Drills and Taps... Reduces Labor Cost 70% On Small Motor End-Plates

This Natco combination assembly and multi-drilling machine presses a bearing sleeve into the end-plate, rough and finish bores the outside bearing-cap hole, drills an oiler hole at an angle, drills four (4) thru-bolt holes, and drills and taps two (2) 8x32 cover plate holes. *Production is 170 pieces per hour.*

This Natco accommodates two sizes of motor end-plates without changes in the basic rotary-table tooling. In addition to this important versatility the engineers at Wagner Electric point out these other advantages:

- *one operator* controls the assembly and machining from one station.
- *work scheduling* is simplified due to the short machine cycle.
- *in-process inventory* can be kept at a minimum because of high production rate.
- *floor space* is made available for other operations.

Natcos perform all kinds of drilling, boring, facing and tapping jobs in every conceivable combination and sequence.

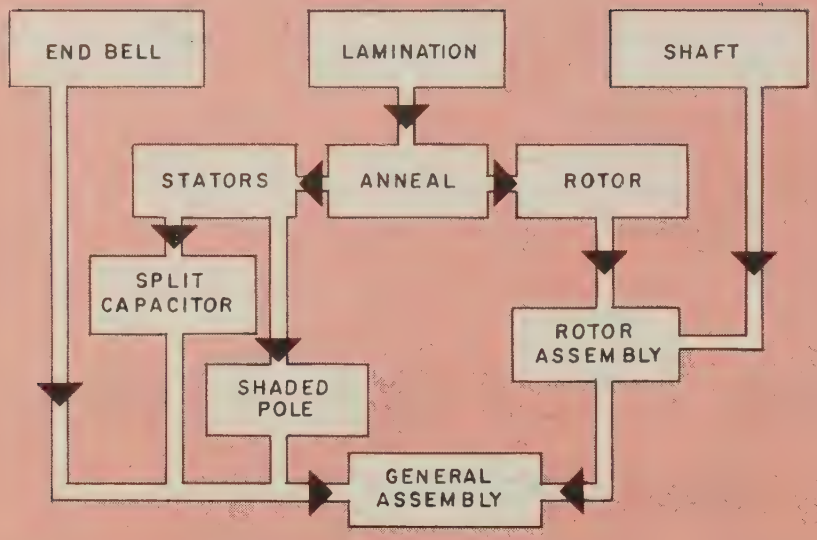
Ask the Natco Field Engineer about the newly perfected tape control systems for Natco production tools.

National Automatic Tool Company, Inc.

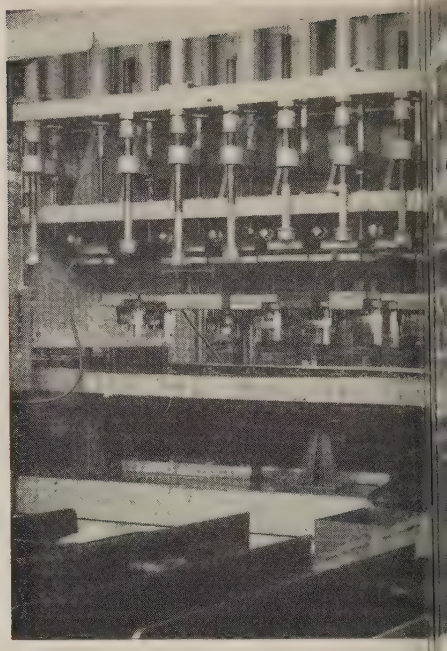
Richmond, Indiana *Multi-spindle drilling, boring and tapping machines. Special machines for automatic production.*

Call Natco Offices in Chicago, Detroit, New York, Buffalo, Philadelphia, Cleveland, Los Angeles; distributors in other cities.

PRODUCTION FLOW CHART



The five major production lines all blend into the general assembly area



Strip is being fed into the multistation transfer press. It forms end bells

Plant Design Is Flexible

Two basically different motors (shaded pole and permanent split capacitor types) are manufactured in 30 styles and types. Production is automated

FLEXIBLE layout has enabled Westinghouse to expand the capacity of its mechanized plant at Upper Sandusky, O., by more than 50 per cent during the two years it has been in production.

Highly automated equipment is coupled with an ample conveyor system. The plant produces motors for direct connected fans and room air conditioners.

Integrated Design—Instead of duplicating a motor already on the market, Westinghouse designed one with a new bearing and lubrication system.

Frank E. Heikkila, manager of the division's industrial motor department said: "Since we were starting from scratch, with neither motor design nor plant, we are able to co-ordinate motor and plant design to take full advantage of the most up-to-date manufacturing processes and techniques."

Production Plan—Motors are made on five basic lines—end bell, lamination, shaft, stator and rotor.

The major lamination and shaft lines are automatic. The others are highly conveyorized and mechanized.

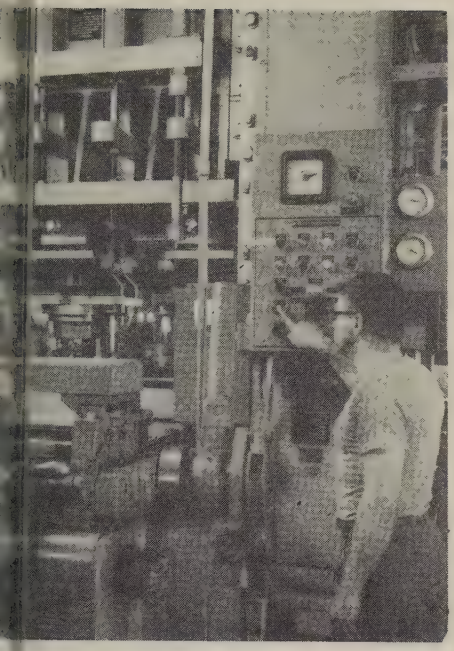
An assembly conveyor which passes the end of each line picks up completed parts. By the time the conveyor passes all lines, each rack contains two complete sets of motor parts, which are ready for final assembly and testing.

Ends Bells—Coil stock, 7¼ to 7¾-in. wide, is fed to a 13-station transfer press. The 600-ton machine uses nine stations that blank, form, pierce and trim 25 end bells a minute.

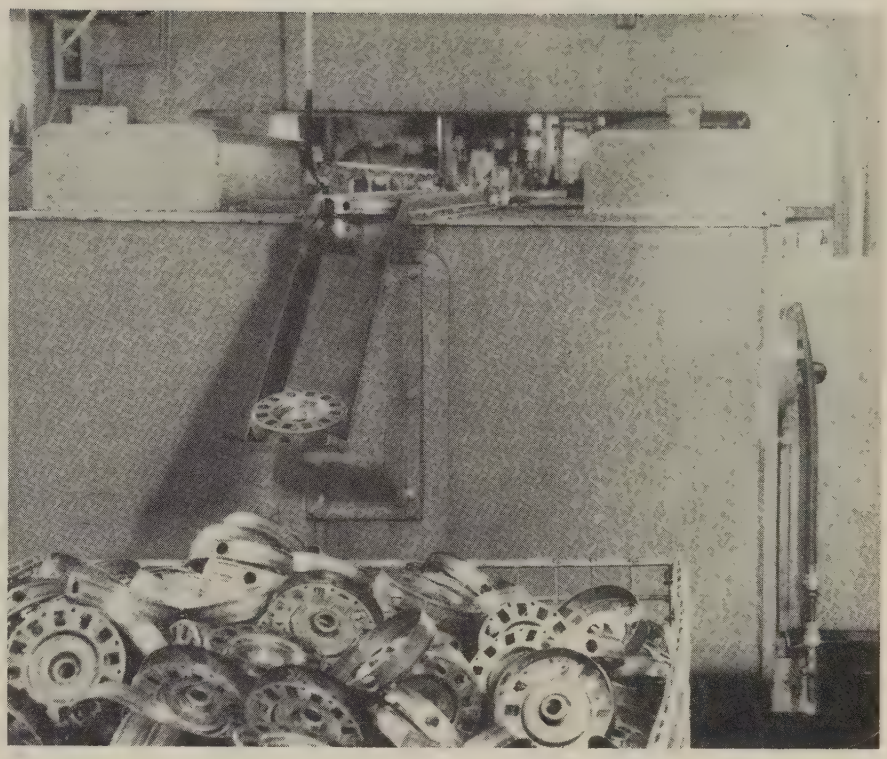
Bearing caps, formed on manually operated progressive presses, are loaded on chain driven hangers with the end bells. They are carried through an automatic washing and drying process to remove die compound and add a phosphate coat for rust protection.

End bells are manually loaded on rotating pedestals where they are painted with lacquer and air dried. Oil and drain holes are drilled in the parts by a semiautomatic pneumatic drill.

Assembly is simplified by a special wicking, bearing assembly and oiling machine. It consists of a hydraulic press, a 12-station indexing table, an automatic oil tube inserting device, two oil measuring and oiling stations and a bearing cap orienting and inserting device.



in nine operations, turning out parts at the rate of 25 a minute



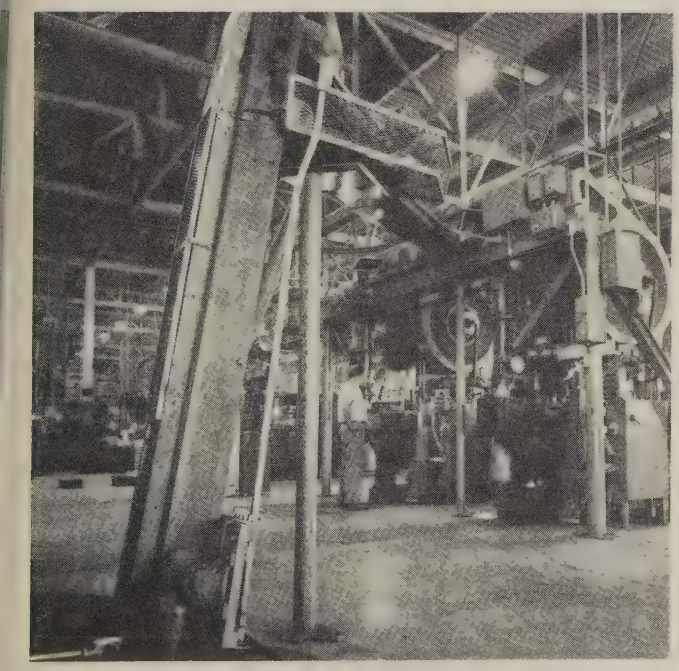
Completed end bells are automatically loaded into crates for transfer to conveyor through the protective painting area

Parts are manually positioned and automatically oiled, assembled and transferred to the grommet inserting and bearing cap staking machines before being transferred to the final assembly conveyor.

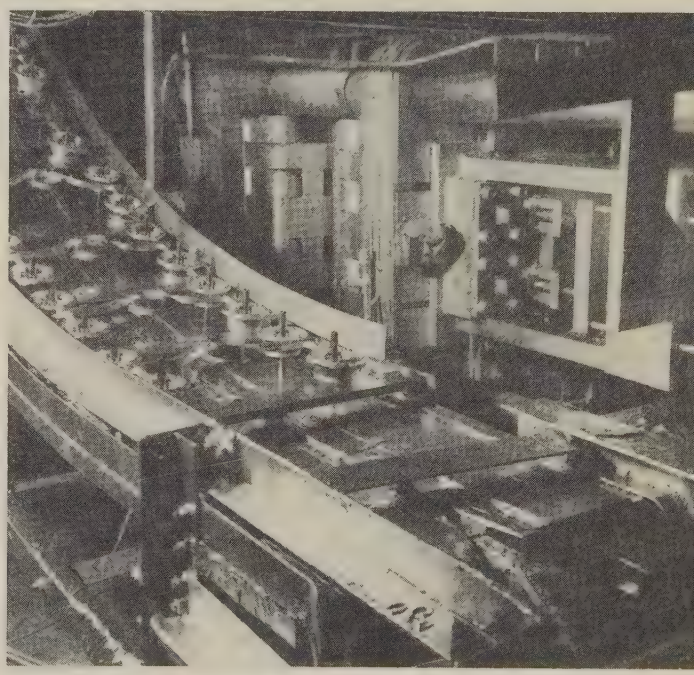
Laminations—The only manual step in this process is loading the coil stock onto the de-reeler. The stock, 0.024 x 35¼-in., is fed to a punch press which makes eight blanks (called cookies) per stroke. Its rate is 33 strokes per minute.

Cookies are picked up on a magnetic belt, which is nearly vertical, and transfers them to an overhead conveyor where they are moved to a tube type feeding hopper at the start of the two lamination punching lines.

Each line has three presses. The first pierces the rotor punching, the



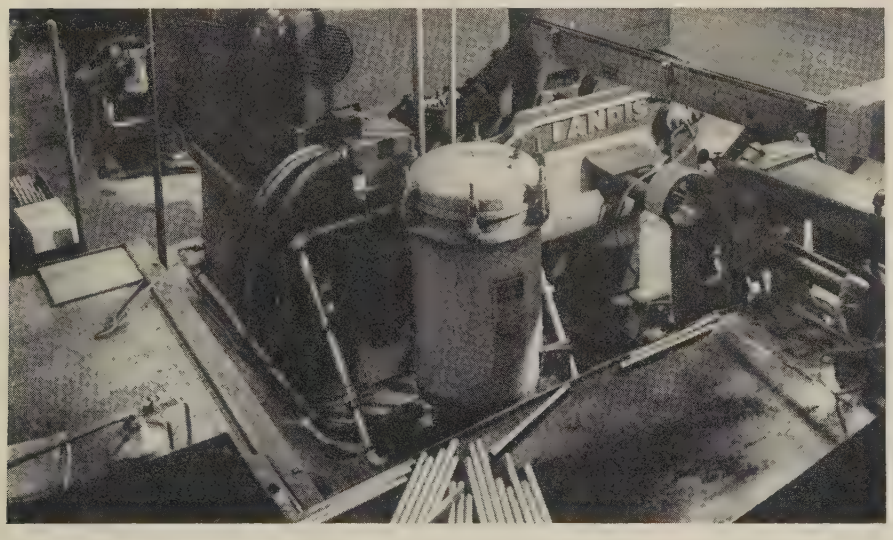
Cookies from the press are carried up the vertical magnetic belt at left. Overhead conveyors feed them into hoppers at beginning of two lamination lines



Rotor punchings are being carried out of the diecasting machine. From here they will go to the turning machine which loads, turns and gages parts before postheating

Laminations are oriented automatically by filtering down over rotating bullet shaped arbors

Forms are manually installed on the stator core. Coil is positioned in the chuck of the winding machine. Winding of all four poles is automatic



The shafts are leaving the centerless grinder on a conveyor leading to the straddle mill where flats are added

second separates the rotor and stator; and the third pierces the stator.

When cookies in the hoppers hit a maximum level, the cookie press automatically shuts off until a minimum level is reached. This control of output is also used in the punching lines, with each hopper controlling the press feeding it.

Rotor punchings leaving the second press are transferred by a wire tube and automatically loaded in stainless steel pallets positioned on the annealing furnace conveyor.

Stator punchings leaving the third press are loaded by hand. Every 20 minutes the annealing furnace discharges a pallet and another is admitted automatically.

The 4½-hour annealing cycle is automatic. The controlled atmosphere furnace has stand-by power, which permits idling during non-working shifts.

Underfloor conveyors carry scrap from the cookie and lamination presses to the outside where it is loaded into a truck trailer.

Rotors—A stack of rotors on a dummy shaft is conveyed to the diecasting machine. Molten aluminum is manually ladled into a well. The rest of the operation is automatic.

A ram moves in and forces the molten aluminum to all stations of the die. After the metal has chilled, the cores are deposited onto a cooling conveyor.

A hydraulic trimming press automatically strips the diecast rotors.

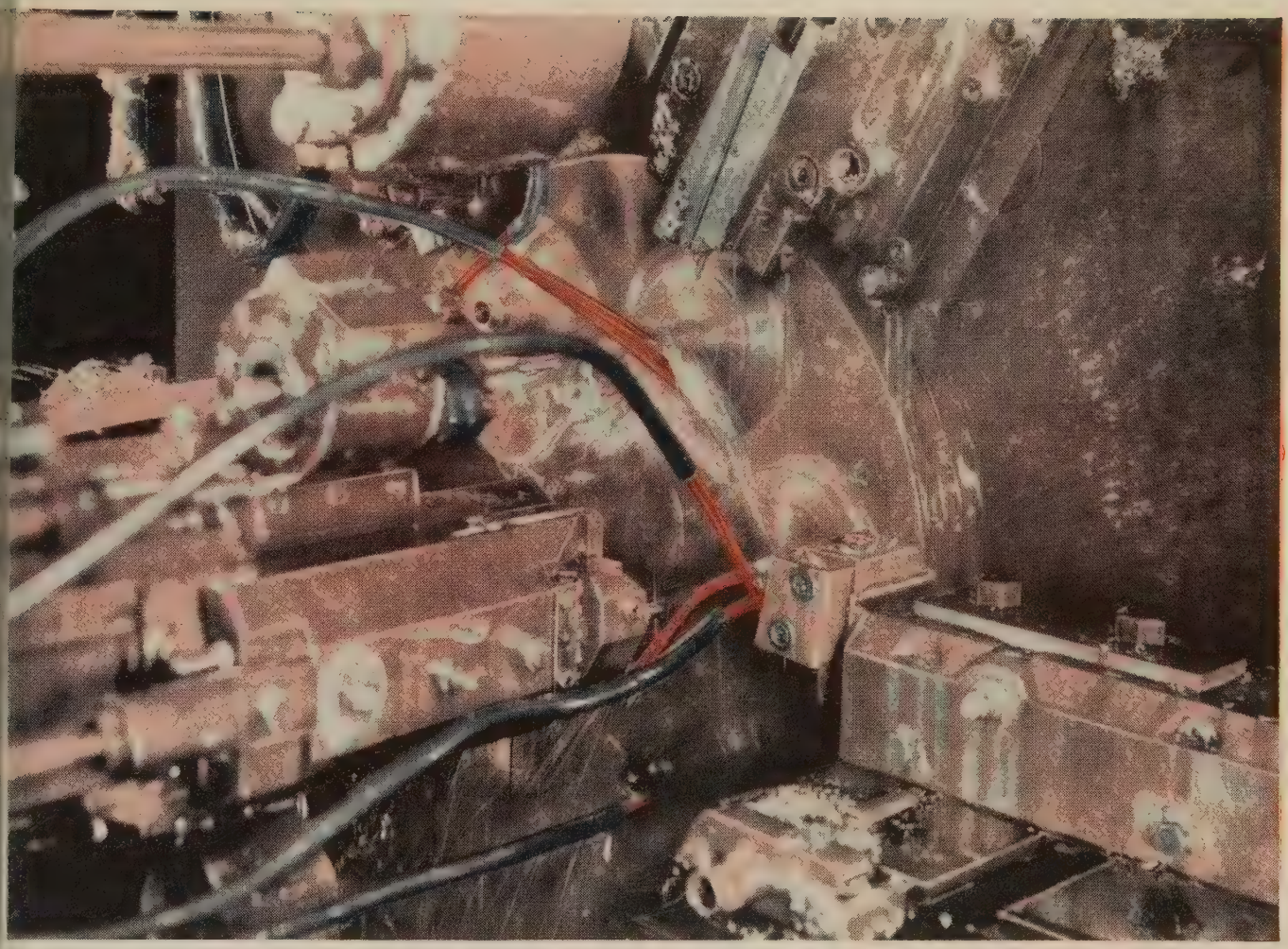
Rotors are automatically fed to a turning machine which loads, turns, gages and transfers the part to the postheat oven.

A circular tool with 48 indexed cutting edges is used in the lathe. If a part gages offsize, the tool automatically advances to a new position.

Rotors are inserted in the oven, cycled and retrieved through the oven with no manual control. The shaft is manually assembled to the rotor and sent to the assembly conveyor.

Stators—Stator punchings are assembled into core stacks and measured. The stacks are oriented and riveted together.

To insert slot cells in the permanent split capacitor stator core, the core is manually loaded into an



This 6-spindle 602 New Britain Gridley is cutting SAE 1112 steel . . . with Gulfcut 31C cutting oil. The results are measurable, in terms of longer tool life, fewer rejects, finer finishes.

They wanted fewer rejects, longer tool life... the answer: GULFCUT

Buswell Metal Products, Inc., of Southington, Conn., keeps 27 automatic screw machines busy turning out precision parts for the aircraft and electronic fields. Their cutting oil: Gulfcut 31C.

Gulfcut 31C provides longer tool life . . . and has helped in reducing rejects to less than $^{2}/_{10}$ of 1%. This sulphurized-mineral-lard oil has outstanding anti-weld properties and load-carrying ability. And it contains sulphur combined in three different forms for maximum chemical activity.

The Gulfcut line includes a cutting oil for *your* specific needs, too. Why not let your Gulf Sales Engineer recommend the right one . . . perhaps cut your costs in a number of ways? Call your nearest Gulf office today!

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THE FINEST PETROLEUM PRODUCTS FOR ALL YOUR NEEDS

indexing fixture. The cell is formed from coil, inserted into core slots and cuffed automatically.

The shaded pole inserting machine includes a ten-station indexing table, a copper-coil inserting device, crimping and welding stations.

The stator winding area is divided for the two designs and a complement of winding machines is provided for each. The stator winding is tested for shorts, grounds and opens.

Stators are dipped in a rise-and-fall varnish tank and conveyed through a varnish baking oven. After baking, two lathes turn end bell fits on stator ends. The finished stator is placed on the final assembly conveyor.

Shafts—This operation is automatic. A large supply of shaft stock (10-ft lengths) is loaded on an automatic feed mechanism that places the bar in a machine where it is chamfered and cut to correct lengths.

The bar blank passes between two centerless grinders for rough and finish grind. Flats are added at an automatic straddle mill, and the shafts are stored until ready for shrink assembly to the rotor core.

Final Assembly—These two lines have three stations each. The conveyor moves between them, directly over the work stations.

One end bell, the rotor and the stator are positioned on a belt driven fixture. The second end bell is added; the leads are fed through the lead hole; and the through bolts are inserted.

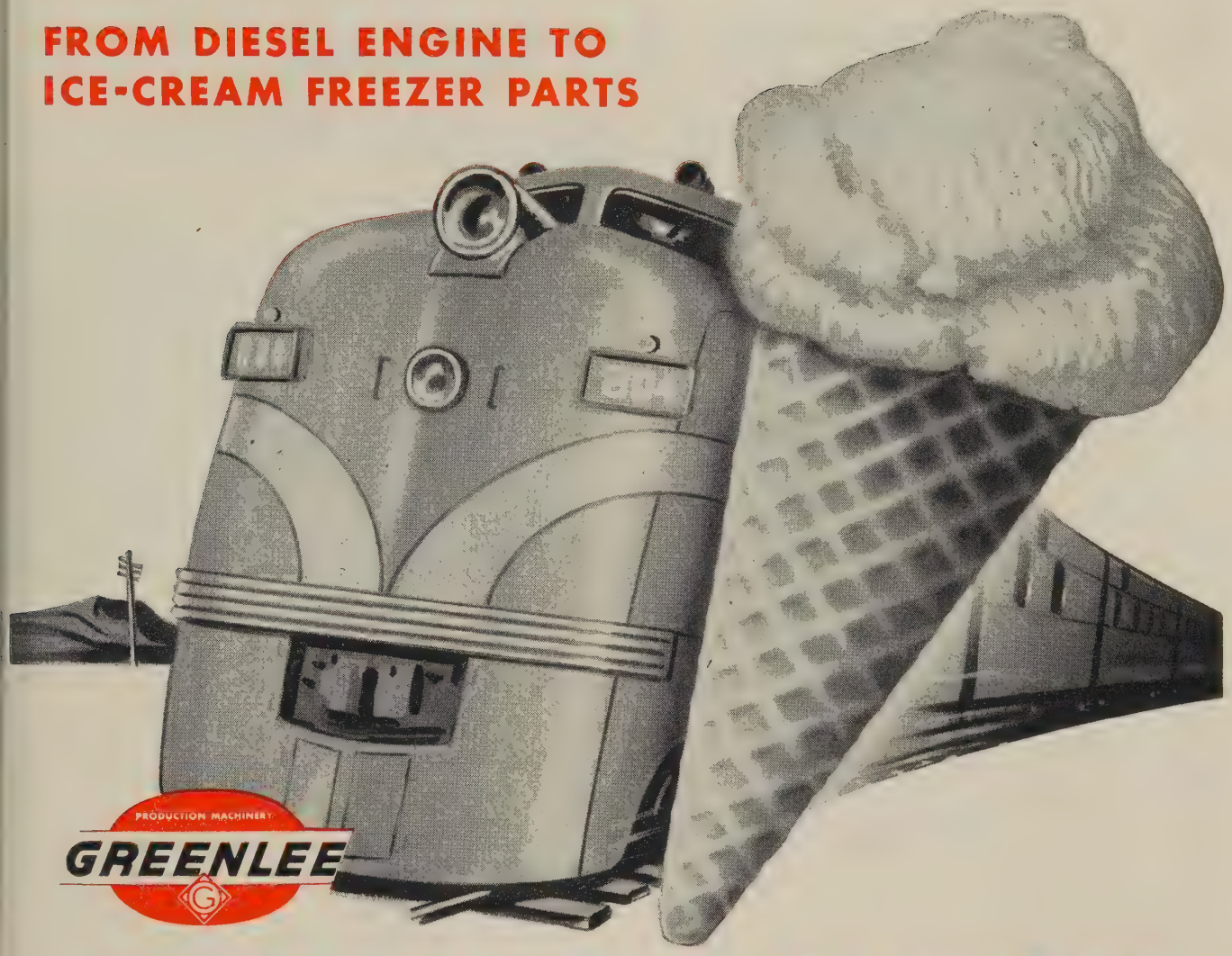
A three-headed pneumatic drill inserts the screws. End play is checked, and the assembled motor is placed on the test conveyor.

It is tested for electrical operating characteristics and noise. Dust caps are assembled; the units are sprayed with enamel and cycled through the paint baking oven.

At the end of the baking cycle, the motors are cooled, identifying decals are added and they are packed for shipment.

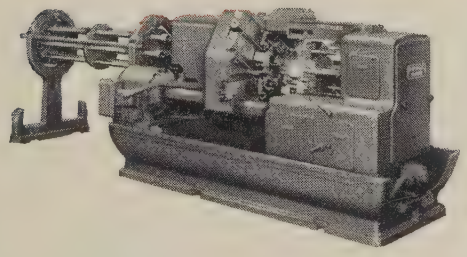
• *An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, O.*

FROM DIESEL ENGINE TO ICE-CREAM FREEZER PARTS



AUTOMATIC BAR MACHINES

Handle All Types of Jobs



SIX AND FOUR-SPINDLE AUTOMATIC BAR MACHINES

GREENLEE Special Machine Tools

- Multiple-Spindle Drilling and Tapping Machines
- Transfer-Type Processing Machines
- Hydro-Borer Precision Boring Machines

✓ *Efficiently...*
✓ *Economically*

Greenlee design permits the handling of a wide variety of operations at various spindle positions . . . makes it easier to split up long operations . . . reduces idling time.

Threading, tapping and reaming can be performed in 3rd, 4th, 5th and 6th positions . . . a special Greenlee advantage. Seven full-length T-slots on the main tool slide will accommodate the tools and attachments needed for a wide range of set-ups. Interchangeable cross-slide tooling and simplified cross-slide camming contribute to greater flexibility and faster set-ups.

Investigate! Ask any owner or operator . . . they'll tell you that Greenlee is one of the most highly respected names in its field.

Write for Catalog No. A-405

GREENLEE BROS. & CO.

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ROCKFORD, ILL.

SPECIAL REPORTS ON FINISHING NON-FERROUS METALS

NUMBER I—Decorative, Corrosion-Resistant Finishing with Iridite

Chromate conversion coatings are well known and accepted throughout industry as an economical means of providing corrosion protection, a decorative finish or a good paint base for non-ferrous metals. However, continued developments are so rapid and widespread that many manufacturers may not be completely aware of the breadth of application of this type of finish. Hence, this digest of current information; to bring you up to date on the many ways in which you can combine salable appearance with durability in one finish at a competitive price advantage. Report II on paint base, corrosion-resistant finishes and Report III on chemically polished, corrosion-resistant finishes are available on request.

First, as a basis for this discussion, a "decorative" finish is considered as any chromate film that is used as a final finish in itself. It may be truly decorative in that its sole purpose is to enhance the beauty of the product. For example, a bright chrome-like finish or a pleasing bronze appearance are among the many effects that can be obtained. It may be functionally decorative in that it reduces reflectivity for camouflage purposes or provides a means of color-coding parts. But, in all cases, the Iridite films protect the metal against corrosive attack.

Iridite finishes are now available for all commercial forms of the more commonly used non-ferrous metals, including zinc, cadmium, aluminum, magnesium, silver, copper, brass and bronze. These films can produce a wide variety of pleasing appearances. The basic colors of the Iridite coatings are grouped below by metals.

ZINC and CADMIUM: Metallic bright, light iridescent, iridescent yellow, bronze, olive drab.

COPPER, BRASS, BRONZE: Metallic bright, yellow.

ALUMINUM ALLOYS: Clear, iridescent yellow, brown.

MAGNESIUM ALLOYS: Light brown, dark brown, black.

SILVER: Metallic bright.

In addition, many films can be modified by bleaching or by dyeing. Among the dye colors available are various shades of red, yellow, green, blue or black.

Depending upon the metal and the Iridite used, corrosion resistance of clear and bright films ranges from mild passivity to as high as 500 hours in salt-spray; on heavier dark films, salt-spray resistance ranges from approximately 100 to 1000 hours.

It is this combination of decorative and corrosion resistant properties that accounts for the widening use of Iridite finishes. For example, Iridites #4-73 and #4-75 (Cast-Zinc-Brite) make possible for the first time, a combination of lustrous chemical polishing of the as-cast surface of zinc die castings and good resistance to corrosion. Further, in many cases, sizeable savings in the cost of buffing and electroplating are realized.

On many steel parts, a simple system of zinc or cadmium plate and bright Iridite is used instead of more costly electroplated finishes to provide a bright, decorative and protective finish with tremendous savings in material, equipment and labor.

In finishing aluminum, where corrosion resistance or paint adherence is the prime consideration, the aircraft industry has all but abandoned the anodizing process in favor of recently developed chromate conversion coatings, among them Iridite #14 and #14-2 (Al-Coat). These formulations and their method of application can be varied to retain the original metallic appearance while providing acceptable corrosion resistance, or to produce a fully colored brown finish that offers exceptional corrosion protection. Again, time and manpower savings are astounding—one company saved at least $15,000 a year on maintenance of racks alone and another $40,000 on materials and labor in only nine months. In addition, of course, hundreds of thousands of dollars are saved by eliminating the need for expenditures for generators, heating equipment and racks.

Iridites are widely approved under both Armed Services and industrial specifications because of performance, low cost and savings of materials and equipment.

In planning or designing, you should consider the many other characteristics of Iridite finishes which may enter into the specific problem. In addition to having decorative and protective functions, these chromate coatings form an excellent base for organic finishes and bonding compounds. They have low electrical resistance. Some can be soldered and welded. The Iridite film itself does not affect the dimensional stability of close tolerance parts.

You can see then, that with the many factors to be considered, selection of the Iridite best suited to your product requires the services of a specialist. That's why Allied maintains a staff of competent Field Engineers—to help you select the Iridite to make your installation most efficient in improving the quality of your product. You'll find your Allied Field Engineer listed under "Plating Supplies" in your classified telephone book. Or, write direct and tell us your problem. Complete literature and data, as well as sample part processing, is available. Allied Research Products, Inc., 4004-06 E. Monument Street, Baltimore 5, Maryland.

WHAT IS IRIDITE®?

Briefly, Iridite is the tradename for a specialized line of chromate conversion finishes. They are generally applied by dip, some by brush or spray, at or near room temperature, with automatic equipment or manual finishing facilities. During application, a chemical reaction occurs that produces a thin (.00002" max.) gel-like, complex chromate film of a non-porous nature on the surface of the metal. This film is an integral part of the metal itself, thus cannot flake, chip or peel. No special equipment, exhaust systems or specially trained personnel are required.

Grinder Uses Two Rams To Reduce Heating

The table of this surface grinder is actuated by two hydraulic rams. Each ram is under pressure only half of the time. When it is not in use, the ram is cooled.

Low pressure (200 psi operating pressure) results is a small hydraulic system. It is easily removed for inspection and maintenance.

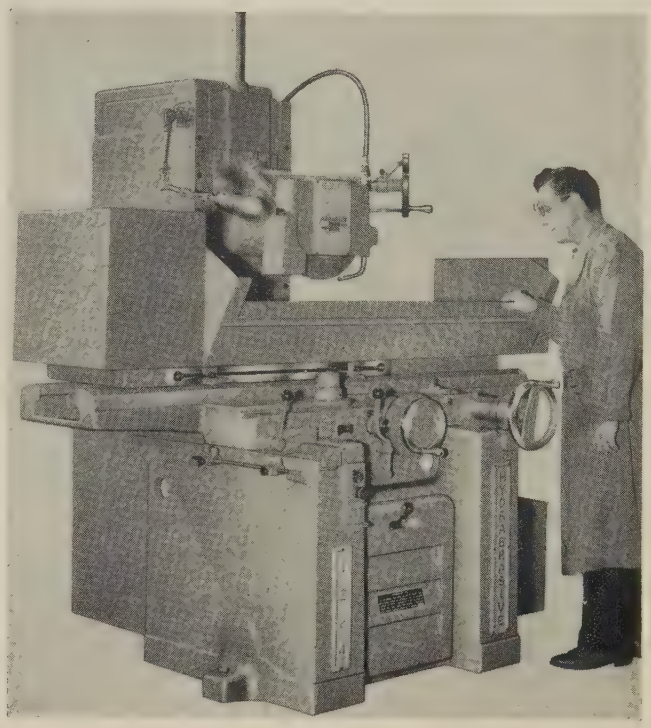
All models (8 x 12 x 24, 12 x 12 x 18 and 12 x 12 x 24 in.) have 12 in. grinding clearance under a 12 in. wheel.

For accurate transverse saddle adjustment, the machines have a ground cross-feed screw with a backlash eliminator and ball bearing saddle ways.

The motor turns the screw for rapid saddle transverse when the wheel is dressed.

Spindles are precision ground and all parts are balanced after assembly. To eliminate binding on the column ways, the head and spindle assembly is balanced on the elevating screw.

All controls are conveniently grouped. They are mechanically interlocked for safety. *Write*: Abrasive Machine Tool Co., Dexter road, East Providence, R. I. *Phone*: Geneva 4-0550



Magnetic Motor Starter Adjusts To Meet Special Conditions

The NEMA size 0 and 1 starters are 42 per cent smaller than previous open forms. The starters are used on machine tools, pumps, hoists, blowers, saws, compressors and packaging machines.

Turning a knob on each of the two overload relays adjusts the overload trip setting up to ±15 per cent of the heater rating. This meets special requirements such as found in areas with varying temperatures.

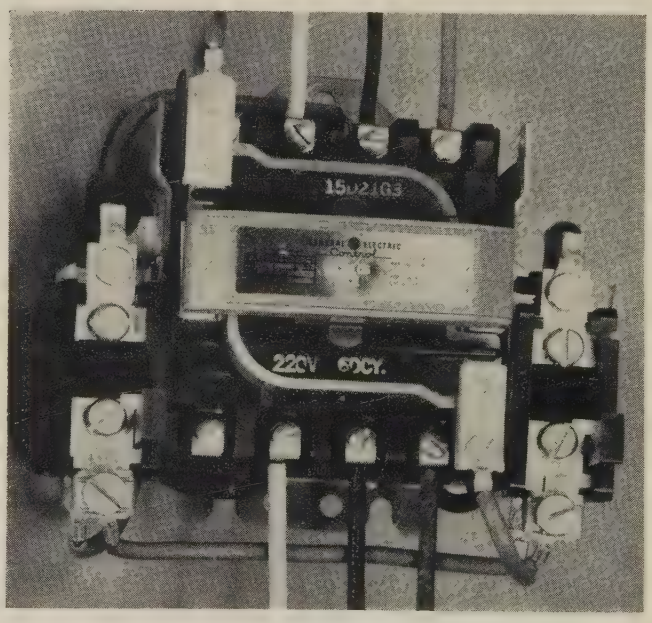
Starter parts are easy to inspect and maintain; they simply snap or slide together. Contacts can be inspected in seconds without using tools.

An improved strongbox coil requires less inrush current and makes possible the use of a lower rated transformer.

The starter can be mounted in any position. Only a screw driver is needed for installation.

All wiring on the unit, including work on interlocks and overload relays, can be done from the front. There is more wiring space even though the unit is smaller than previous models and sides can be removed easily to provide extra wiring space. The enclosure has ten combination knockouts for wiring convenience.

Straight-through wiring speeds installation. Leads go directly to all line terminals at the top and from all load terminals at the bottom. Stranded or solid wire up through size No. 8 can be used.



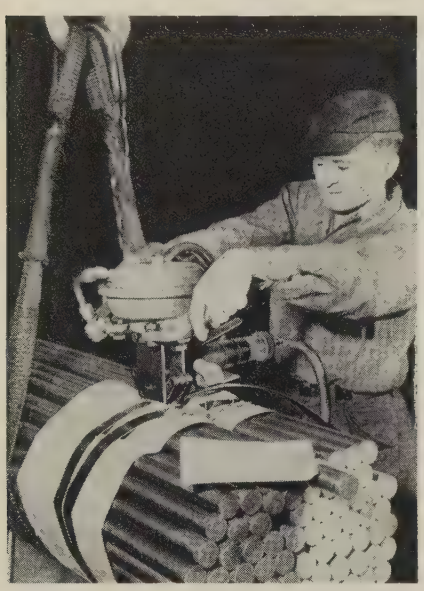
The open form starter weighs 3 lb. An enclosed form weighs 6 lb. Size 0 is rated up to 5 hp at 440 volts. Size 1 is rated for 10 hp at 440 volts. *Write*: General Electric Co., Schenectady 5, N. Y. *Phone*: Franklin 4-2211

NEW PRODUCTS and equipment

Strapping Tools

Up to 1 ton of tension can be supplied by this stretcher which weighs 8 lb.

It crimps each seal uniformly to assure maximum joint strength. The stretcher is air powered.



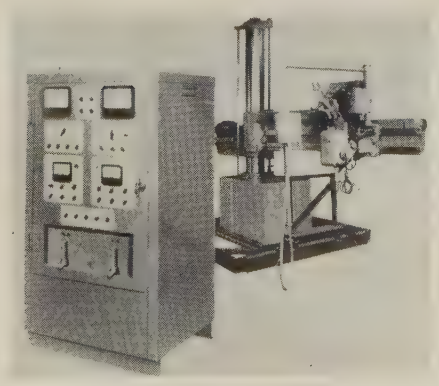
A second model provides up to 3900 lb of tension. It includes a cutter attachment for use with 1¼-in. strapping. *Write*: Signode Steel Strapping Co., 2600 N. Western Ave., Chicago 47, Ill. *Phones* Armitage 6-8500

Arc Welding Control

This control station provides all jogging movements, the weld start, emergency stop and manual initiation of current decay.

It can be used with an automatic arc spot welder, timed and automatically sloped, and manual welding with regulated current and automatic slope for crater elimination.

The unit contains the arc power supply, automatic arc length control, wire drive, carriage drive, gas and water controls and the timer sequence.



All electrical apparatus, except the motor, are interwired in the cabinet. *Write*: Weltronic Co., 19500 W. Eight Mile Road, Detroit 19, Mich. *Phone*: Kenwood 2-2800

Welding Rod

This rod is used for all types of joints in stainless steel fabrication and for dissimilar metal joining, including copper, brass and bronze.

The silver bearing alloy is lead free. A self-contained flux permits tinning action and provides control during the joining. *Write*: Technical Information Service, Eutectic Welding Alloys Corp., 40-40 172nd St., Flushing 58, N.Y. *Phone*: Flushing 8-4000

Magnetic Particle Testing

This attachment enables one man to test parts with magnetic powder. Elimination of the second man is possible since the part will remain in electrical contact with any magnetic surface as long as desired.

A single inspector applies the powder after the leeches have been set in position. *Write*: Magnaflux Corp., 7300 W. Lawrence Ave., Chicago 31, Ill. *Phone*: Underhill 7-8000

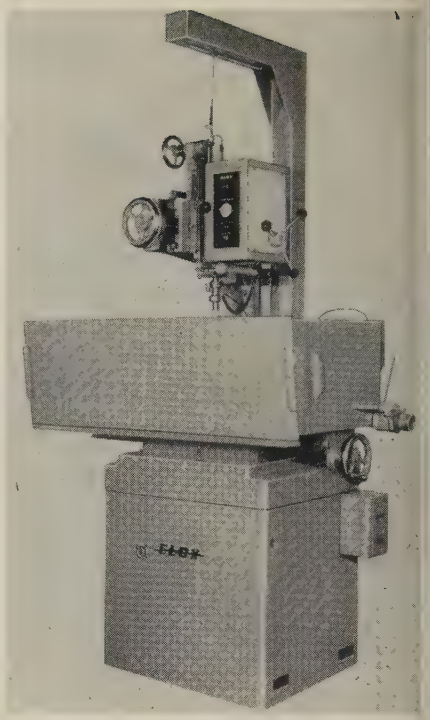
Die Machining

This apparatus machines any metal regardless of hardness or density. It is used to make dies.

Machining is done by electrical energy. This eliminates burred or feathered edges.

The cutting tools can be machined, forged, extruded from brass or cast from Elo-Met, an alloy developed for the purpose.

Adjustment of the electrode to the workpiece is controlled by longitudinal travel on the table, cross slide travel on the overarm and vertical adjustment on the cross slide assembly.



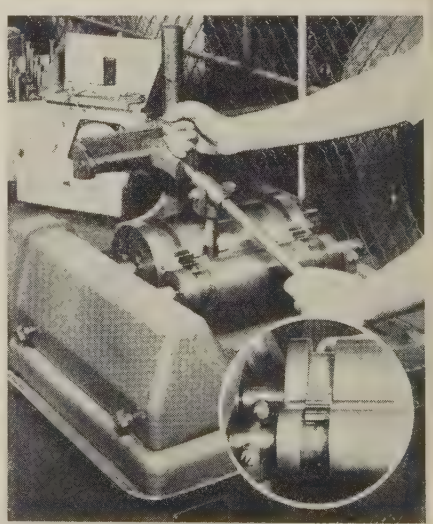
Machining is completely automatic. *Write*: Elox Corp. of Michigan, 1830 N. Stephenson Highway, Royal Oak 3, Mich. *Phone*: Mulberry 9-1921

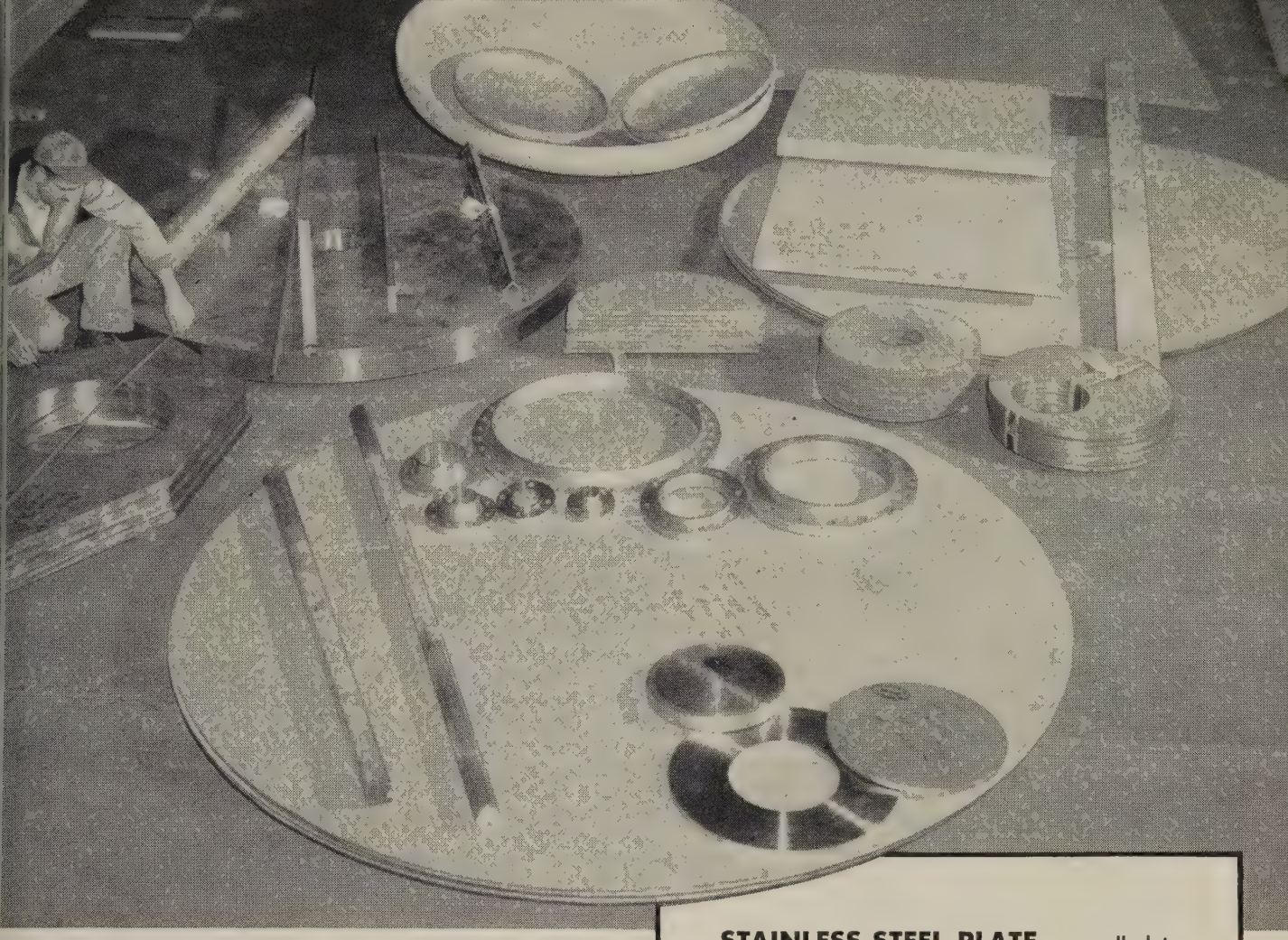
Lapping Machine

Contour cutouts are custom-made for this machine used in lapping cylindrical piece parts with shoulders or other angular obstructions.

Instead of balancing each cylindrical piece on the lapping roller, the part is dropped into the correct position for lapping.

Rollers and their sleeve bearings remove as a single unit. They are





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STAINLESS STEEL PLATE . . . rolled to almost any size or thickness, 3/16" and heavier, to meet your individual needs—whether rectangles, circles or special patterns. Substantial tonnage in Types 302, 304, 304-L, 309, 309-S, 310, 316, 316-L, 317, 317-L, 321, 347, 348, 405, 410, 430 and 502-½% Mo. is available for prompt delivery. In addition, two precipitation-hardening grades, Types 17-4 PH* and 17-7 PH* are now in production.

STAINLESS STEEL HEADS . . . in Types 304, 304-L, 316 and 316-L are available from stock in ASME and Standard specifications (10" to 72" diameter). A large assortment of dies is available for pressing other types of heads and special sizes can be spun where practical.

STAINLESS STEEL FORGINGS and SPECIAL PATTERNS . . . including tube sheets, flanges, circles, rings, sketch plates and other specialties can be produced to specification on our versatile equipment.

Also STAINLESS STEEL BARS AND SHEETS (No. 1 Finish).

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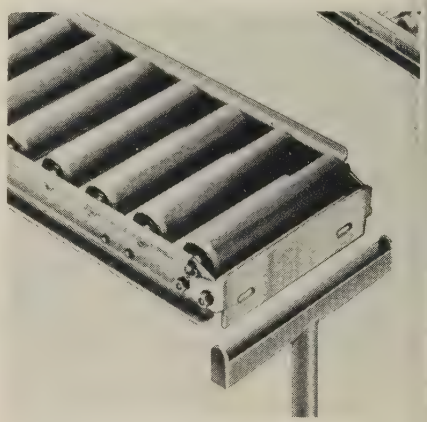
PLATES • PLATE PRODUCTS • HEADS • RINGS • CIRCLES • FLANGES • FORGINGS • BARS and SHEETS (No. 1 Finish)

positioned simply by tightening the setscrews that hold the rollers in place. *Write*: Spitfire Tool Co., 2931 N. Pulaski Road, Chicago 41, Ill. *Phone*: Palisade 5-1610

Conveyors

Both ends of these conveyor sections are identical and each section is a complete unit. This facilitates setting up and eliminates end-for-end shifting.

The conveyors are equipped with extended end plates. They fit slotted tops of tubular stands forming the coupling unit.

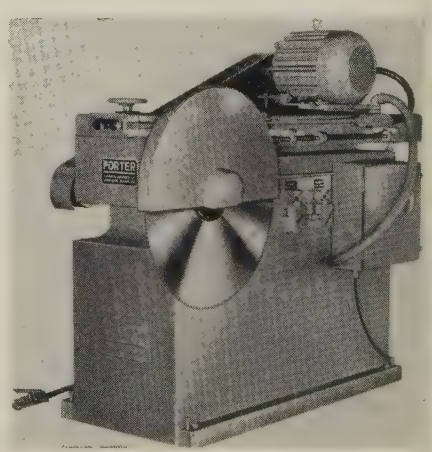


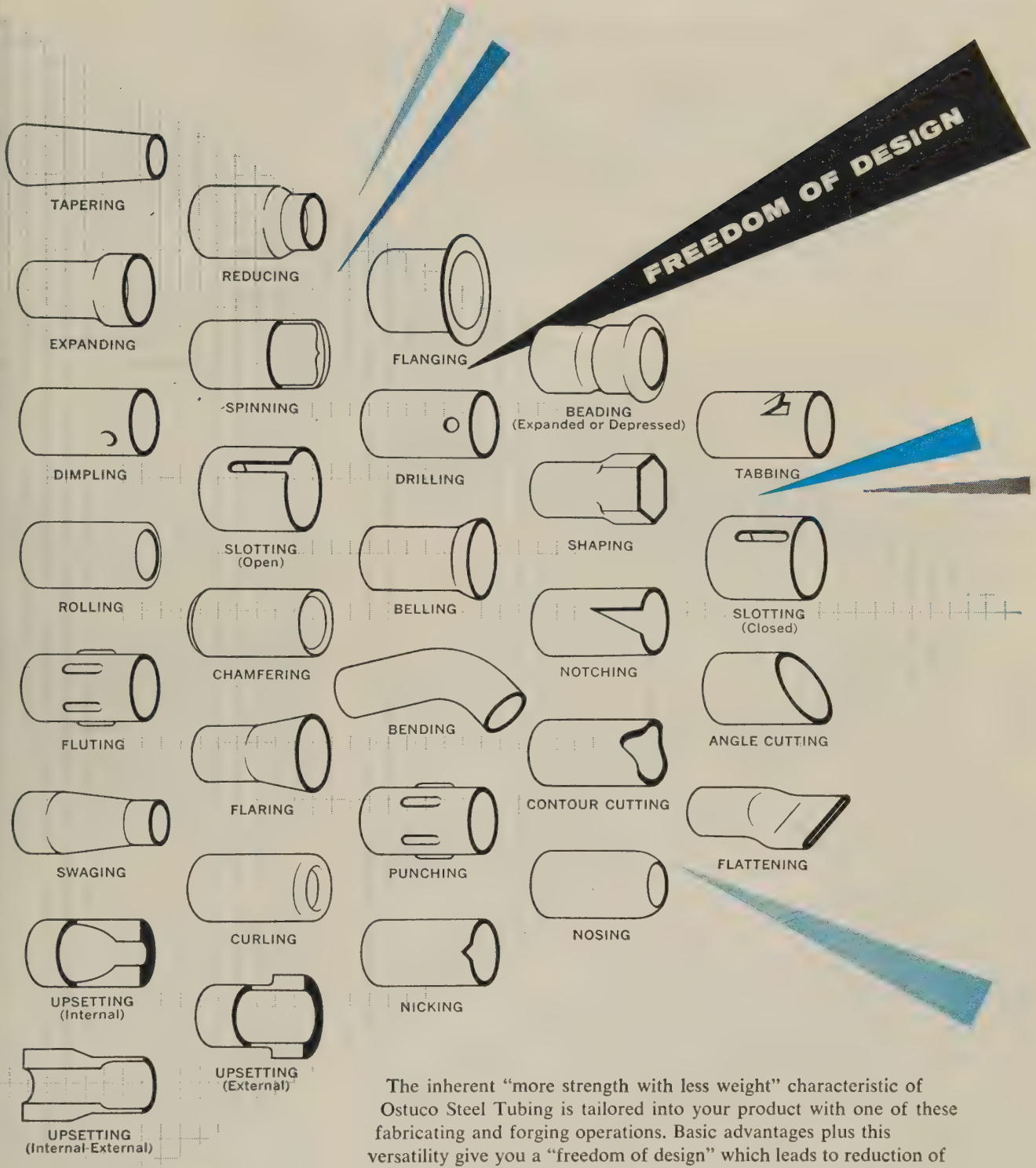
Stands are easily raised or lowered to give the proper conveyor slope. *Write*: E. W. Buschman Co., Clifton and Spring Grove avenues, Cincinnati 32, O. *Phone*: Mulberry 1-1600

Cutoff Saw

The hydraulically operated carriage is adjustable from zero to 55 ft a minute. Stroke sizes are 24 and 36 in.

The operator positions the stock,





The inherent "more strength with less weight" characteristic of Ostuco Steel Tubing is tailored into your product with one of these fabricating and forging operations. Basic advantages plus this versatility give you a "freedom of design" which leads to reduction of materials, production and labor costs and improvement of your product.

Contact your nearest Ohio Seamless sales office or write direct for full information on Ostuco Seamless or Electric-Resistance Welded Steel Tubing, new NP-60 Steel Tubing (specially processed for machinability), and fabricating and forging facilities available to you.

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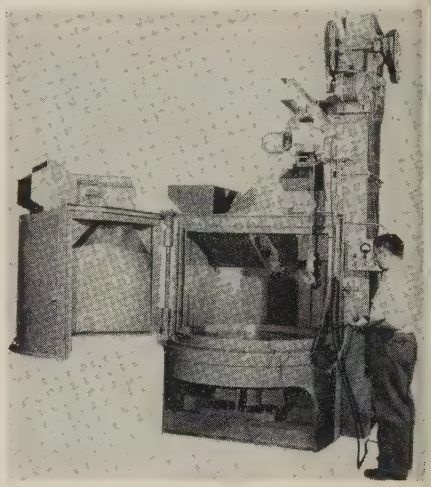
CANADA: Railway & Power Engr. Corp., Ltd.
EXPORT: COPPERWELD STEEL INTERNATIONAL COMPANY, 225 Broadway, New York 7, New York

NEW PRODUCTS and equipment

presses an electrically operated pedal and the blade moves forward on the carriage, makes a cut and returns to position. *Write*: C. O. Porter Machinery Co., Grand Rapids, Mich. *Phone*: Glendale 6-5376

Cleaning Table

A 10-hp motor throws 15,000 lb of abrasive an hour to clean loads of up to 4000 lb. Castings, forgings and stampings up to 48 in. in diameter and 24 in. high are blasted in the unit.



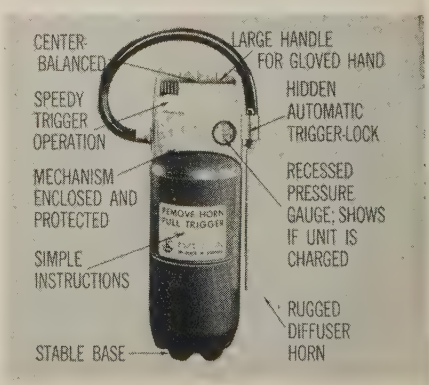
A single door opens to expose half of the 48 in. rotating worktable.

A self-contained elevator and separator automatically clean used abrasive for recirculation. *Write*: Pangborn Corp., Hagerstown, Md. *Phone*: Hagerstown 3500

Fire Extinguishers

Portable fire extinguishers (20 and 30 lb capacities) use dry chemicals to form a cloud for smothering fires.

Pressure gages show whether the



units are charged. To operate: Aim the discharge horn at the fire and pull the trigger.

As long as the discharge horn is held in the clip, a small plunger remains depressed to lock the discharge trigger. When the horn is removed the trigger is ready for use. *Write*: Walter Kidde & Co., Belleville, N. J. *Phone*: Plymouth 9-5000

Electroplating

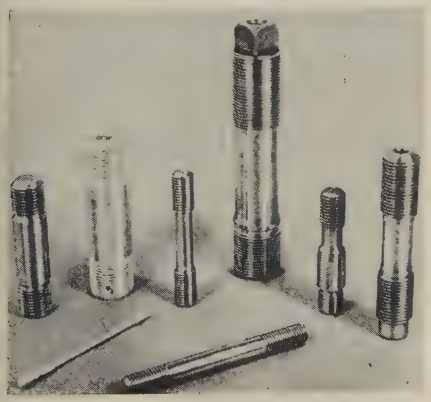
The Enbond "Z" process is for treatment of zinc base diecastings. It produces an active surface for standard copper plating operation. The cleaner and activator are supplied in powder form.

A second process, Enbond "BR," prepares brass and other copper alloys for any type of electrodeposit. *Write*: Enthone Inc., 442 Elm St., New Haven, Conn. *Phone*: Spruce 7-5581

High Strength Studs

These studs are for use in high temperature and high pressure fastening jobs.

The studs range in size from ½ to 6 in. in diameter and from



6 to 72 in. in length. They weigh up to 800 lb.

Studs for moderate temperature applications have a tensile strength of up to 220,000 psi. *Write*: Standard Pressed Steel Co., Jenkintown, Pa. *Phone*: Turner 4-7300

Wire Flattening Mill

Strip ranging from 0.010 in. up and in widths to ⅝-in. is produced by this tandem mill. Each stand

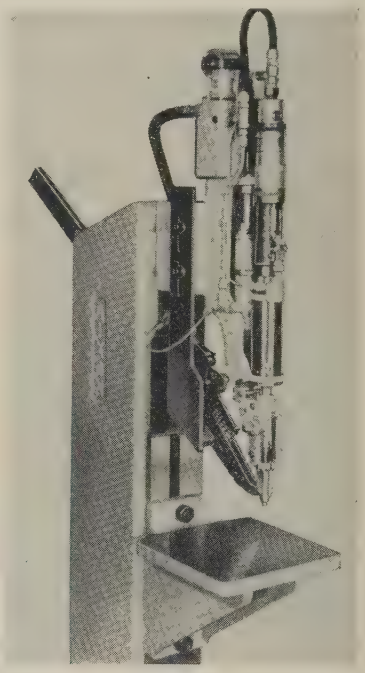
has rolls that are 8 in. in diameter and 5 in. wide.

A handwheel worm gear screwdown with a micrometer dial graduated in 0.0001 in. assures accurate pass control. Close width tolerances are maintained by means of a vertical edging unit on the entry side of the second mill stand.

The recoiler is synchronized electrically to provide constant tension and winds coils up to 500 lb. *Write*: Stanat Mfg. Co. Inc., 500 Shames Drive, Westbury, N. Y. *Phone*: Edgewood 4-8700

Automatic Screw Driver

A sensing device stops this machine if a screw or nut is not properly placed or torqued. It drives screws and nuts up to 5/16-in. thread size at speeds of 60 a minute.

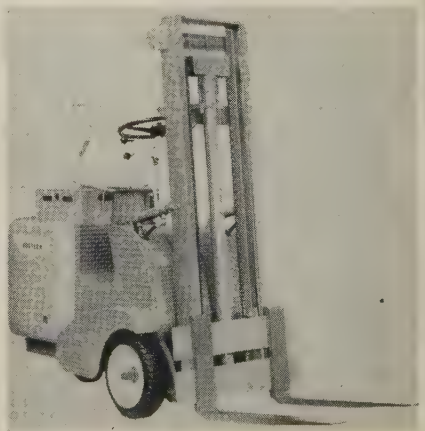


The torque range can be adjusted from 10 to 108 in.-lb. The machine operates at 2000 rpm and has a 3-in. stroke. *Write*: Dixon Automatic Tool Inc., 2300 23rd Ave., Rockford, Ill. *Phone*: 5-8756

Electric Lift Truck

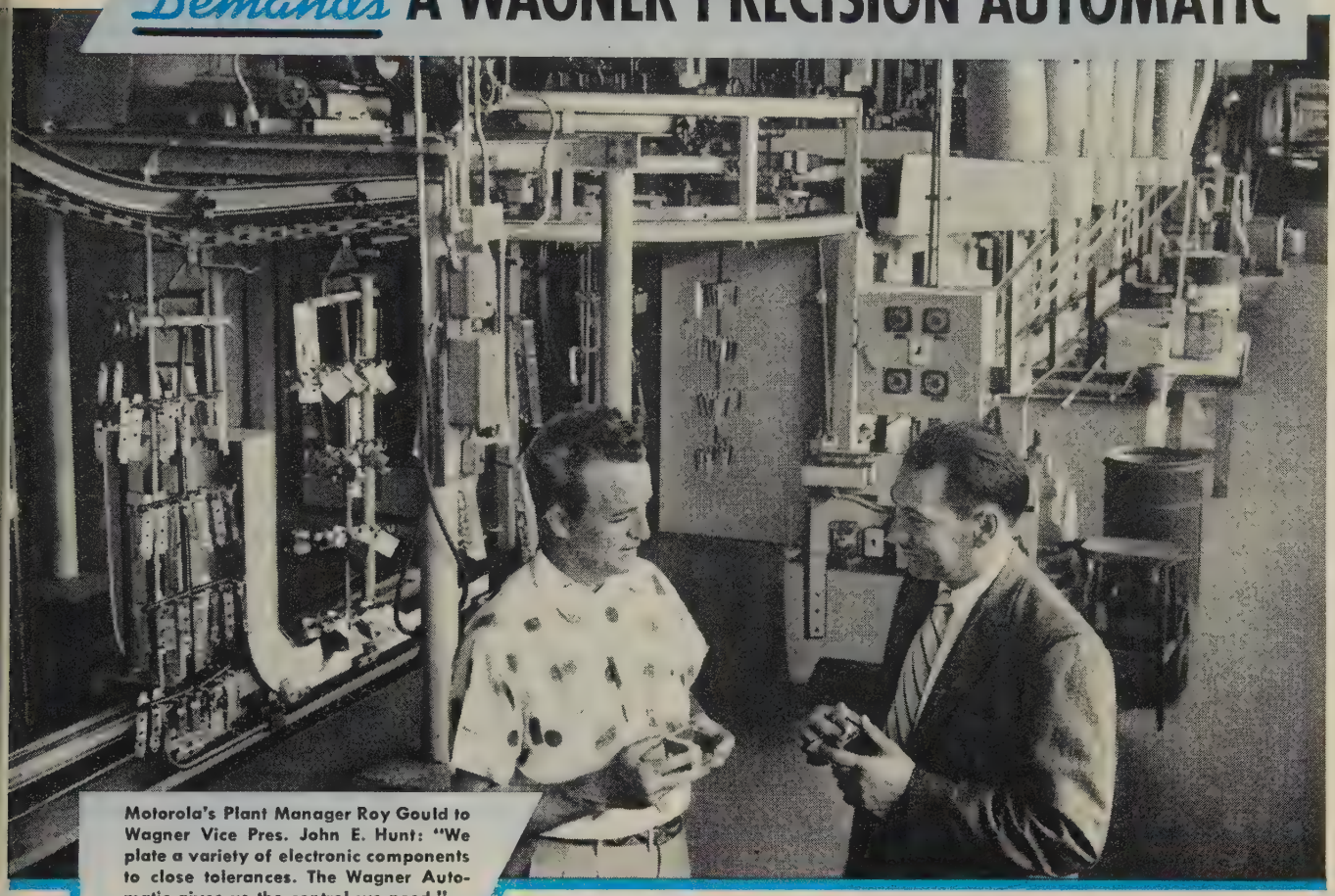
The power and drive unit of this truck can be replaced by removing six bolts. The unit consists of front wheels, axle, differential, gear reducer, motor and brake assembly.

An adjustable pallet fork has a tilt range from 10 degrees back-



MOTOROLA'S PRECISION PLATING

Demands A WAGNER PRECISION AUTOMATIC



Motorola's Plant Manager Roy Gould to Wagner Vice Pres. John E. Hunt: "We plate a variety of electronic components to close tolerances. The Wagner Automatic gives us the control we need."

Television and other electronic components are cadmium plated to specifications much more rigid than most military parts. That's why Motorola, Inc., after an intensive study of all makes of automatic plating machines in the plants of its suppliers and many other manufacturers, specified a Wagner Automatic for their critical work, a deposit of .0003″ +.000075″ —0″. This precision plating machine, designed to solve Motorola's problems but using many standard components, now produces 95% of the requirements of the Communication and Industrial Electronics Division, proof of the versatility of Wagner design and engineering.

Plant Manager Roy Gould says, "Only the Wagner Automatic offers all the features desired, in addition to the greatest output per hour of the quality plating we demand. We like the smoothness of lift and transfer, the absence of impact, the elimination of a tremendous superstructure, and the foolproof hydraulic system. The simplicity of design and the standardization of parts and assemblies enable our mechanics to handle all adjustments and maintenance. The installation was fast—and the Wagner men performed their company's contractual and unspoken obligations competently and without hesitation. Since the first week or two of running, only minor adjustments have been needed."

Remember, only Wagner manufactures the equipment and processes the chemicals required by your plant. For information on Wagner automatic plating machines and materials handling engineering services, write today or call our representative in your area.

MANUFACTURERS AND PROCESSORS OF ALL METAL-FINISHING CHEMICALS, ANODES, AND EQUIPMENT

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CHICAGO • CINCINNATI • CLEVELAND • INDIANAPOLIS • NEW YORK • ROCHESTER • GRAND RAPIDS

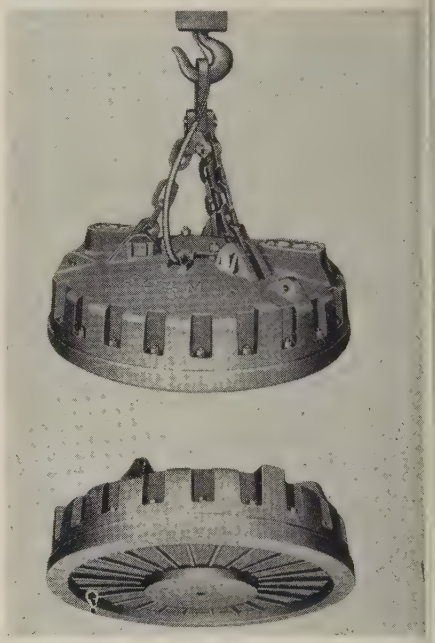
Wagner BROTHERS INC.

ward to 3 degrees forward. Mast height is a minimum of 60 in.

The model has 1000, 2000 and 3000 lb capacities. *Write*: Hustler Corp., Elm road, Willoughby, O.

Magnets

These magnets (57 and 66 in. in diameter) permit field replacement of worn pole shoes.



Welds may be ground or chipped off by an air hammer for removal of the spool and coil. *Write*: Square D Co., 4500 Lee Road, Cleveland 28, O. *Phone*: Ludlow 1-1800

Hot Spray Units

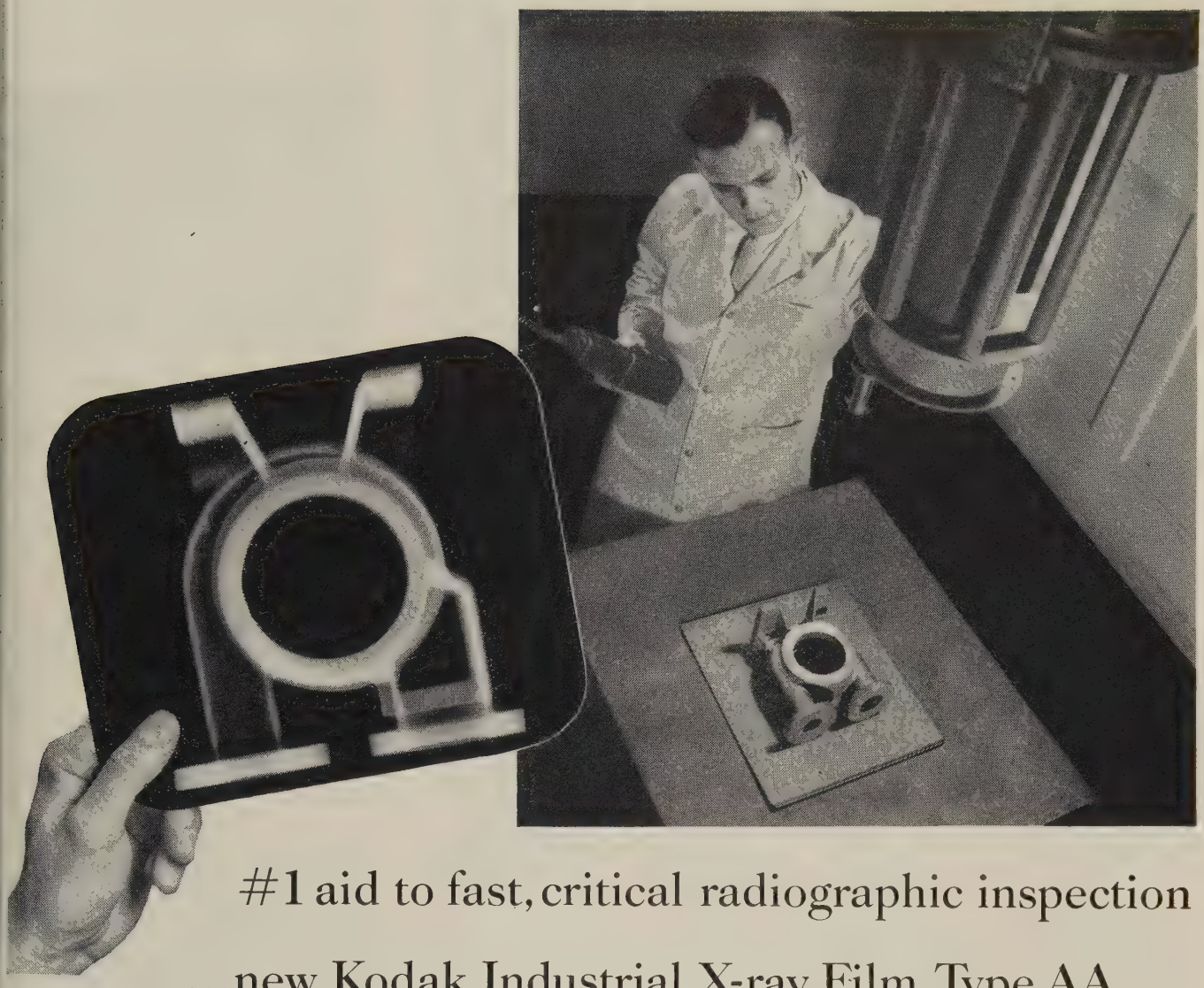
The operator can select paint temperature by setting the controller. The unit provides hot spray for one or two guns on hose lines up to 75 ft long.

A hot spray heater and reciprocating pump are combined in a portable unit which carries the original 5 or 10-gallon container. *Write*: Spee-Flo Co., 720 Polk, Houston, Tex. *Phone*: Capitol 5-0461

Cradle and Straightener

Material up to 16 in. in width and coils with an OD of 48 in. can be handled with this machine.

The straightener has eight rolls



#1 aid to fast, critical radiographic inspection

...new Kodak Industrial X-ray Film, Type AA

TODAY'S radiographic inspections call for increased sensitivity, greater speed. And these are the characteristics of Kodak's newest industrial x-ray film, Kodak Industrial X-ray Film, Type AA.

This film retains all the excellent qualities that made Kodak Type A the most widely used x-ray film in industry. Then, in addition, it provides greatly increased speed.

This permits exposure time to be cut as much as 50%. It allows adjustment of the radiographic factors to obtain greater contrast and easier readability.

Kodak X-ray Film, Type AA can multiply your minutes—can extend the usefulness of your present radiographic equipment.

Find out all the ways it can improve your production. Get in touch with your x-ray dealer or Kodak Technical Representative.

EASTMAN KODAK COMPANY
X-ray Division Rochester 4, N. Y.

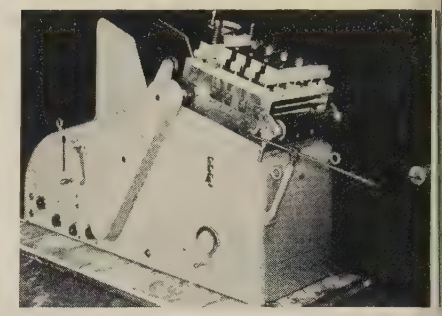
Read what the new Kodak Industrial X-ray Film, Type AA, does for you:

- Reduces exposure time—speeds up routine examinations.
- Provides increased radiographic sensitivity through higher densities with established exposure and processing technics.
- Gives greater subject contrast, more detail and easier readability when established exposure times are used with reduced kilovoltage.
- Shortens processing cycle with existing exposure technics.
- Reduces the possibility of pressure desensitization under the usual shop conditions of use.

Kodak
TRADE MARK

Kodak Industrial X-ray Film, Type AA and Type M is now available in 100-sheet boxes wrapped without interleaving paper. Designated as AA-100; M-100.

NEW PRODUCTS and equipment

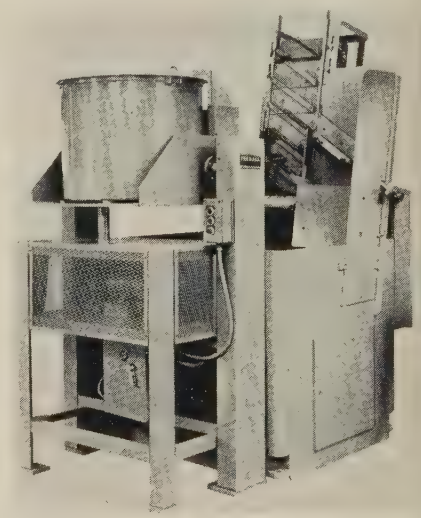


(lower four are power driven). The cradle has four power driven rest rolls, one idler rest roll and one bumper roll.

This unit is equipped with a 3-hp variable speed motor. *Write*: U.S. Tool Co. Inc., Ampere (East Orange), N.J. *Phone*: Orange 5-4000

Elevating Feeder

Automatic movement of parts from a barrel conveyor line into machines is provided by this machine. It can feed both rolling and sliding parts.



The angle of elevation, depth of conveyor cleats and right or left-hand power takeoff may be varied to handle different parts. *Write*: Feedall Inc., 38399 Pelton Road, Willoughby, O. *Phone*: Willoughby 2-8100

Punch Card Control

Machine tool, multiple valve and programming control are possible with this punch card system.

A punch card signal with a binary code directly assigns a position to a control motor which has

NEW PRODUCTS and equipment

position-to-binary follow-up device.

When a desired formula is to be run, the card is inserted in the reader. It simultaneously sets the desired feed rates of all components. *Write*: Graham Transmissions Inc., Menomonee Falls, Wis. *Phone*: Menomonee Falls 3600

Overhead Crane Kit

This kit contains two truck frames, four crane trolleys and all necessary bolts and fittings. The crane beam and the angle end stops are supplied by the user. The crane is assembled with simple hand tools.

The trolleys are adjustable to permit their use on many runway sizes. Trolley wheels are furnished for either tapered or flat flanged beams. *Write*: Becker Crane & Conveyor Co., 4900 Ridge Road, Cleveland 9, O. *Phone*: Shadyside 9-2733

Milling Cutters

Replaceable milling cutters for sawing and cutting narrow slots are made in any diameter from 3 to 24 in. and in widths from 3/16 to ¾-in.

Ground blade faces and ample chip room give a free-cutting action. *Write*: Apex Tool & Cutter Co., Shelton 13, Conn. *Phone*: Regent 4-5244

Burners for Hot Air

This burner is for use with preheated air up to 1200°F. Its internal parts are made with high temperature alloys. The body of the burner is refractory lined.

Heavy oil is atomized by the use of steam or compressed air. The burners can be supplied with internal or external mixing atomizers. Both are retractable for protection during gas firing.

All burner parts can be removed from the back without disconnecting the burner from the furnace

or hot air pipe. *Write*: North American Mfg. Co., 4455 E. 71st St., Cleveland 5, O. *Phone*: Broadway 1-6000

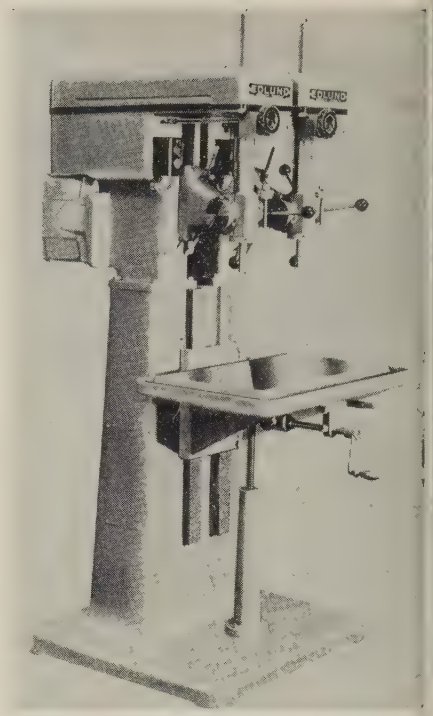
Rope Carries Signals

In addition to transmitting force for hoisting and other material handling operations, this steel wire rope can transmit continuous communication instructions through copper wire conductors imbedded in its fiber core.

The rope (sizes ¾ to 2 in. in diameter) has a breaking strength of 42,840 to 320,000 lb. *Write*: American Chain & Cable Co. Inc., 929 Connecticut Ave., Bridgeport 2, Conn. *Phone*: 7313

Drilling Machine

Machines with one to six spindles and speeds ranging from 625 to



10,000 rpm use a 10 in. overhang to make small parts and assemblies.

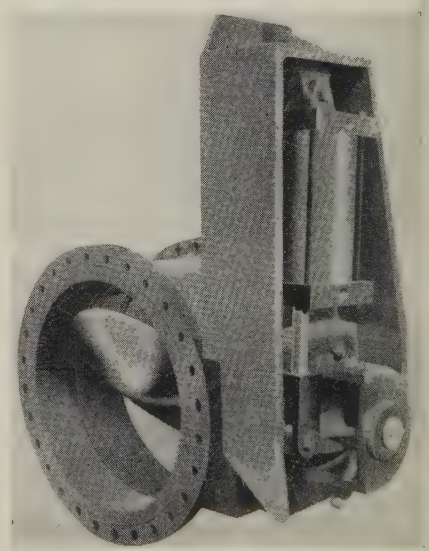
Positive control of speeds is obtained by setting a knob on the upper column. Exact speed is shown in the indicator window. *Write*: Edlund Machinery Co., Cortland, N. Y. *Phone*: Skyline 6-5661

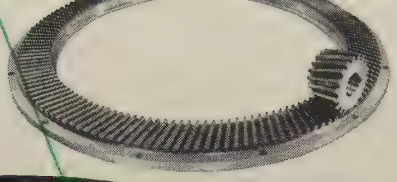
Butterfly Valves

These valves (sizes, 6 to 96 in.) are equipped with removable seats of synthetic or natural rubber.

The shaft is a one-piece unit, extending completely through the disc. The valve uses sleeve type self-lubricating bronze bearings.

Operation can be manual or automatic. *Write*: S. P. Kinney Engineers Inc., 201 Second Ave., Carnegie, Pa. *Phone*: Browning 6-4600

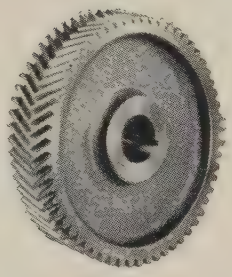




Wherever Power is on the move...

INDUSTRY DEPENDS ON ILLINOIS GEAR

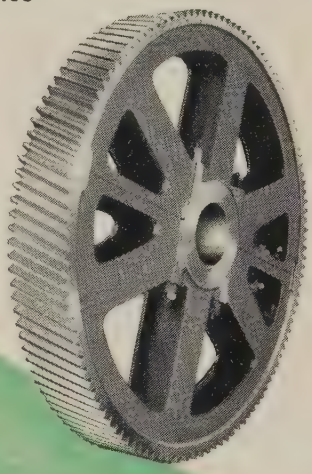
Throughout the world . . . wherever power is on the move . . . ILLINOIS GEARS are *delivering this power* dependably year in and year out.

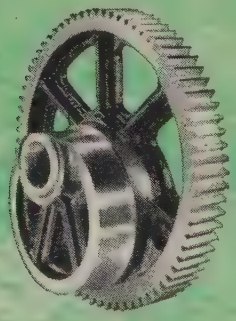


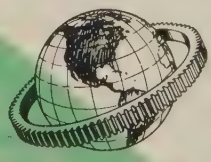
Whether it is in machine tools, steel mills, cement mills, paper mills, chemical plants, construction equipment . . . machinery of any kind . . . this dependability, proven by performance, means true economy that has resulted in enduring customer satisfaction.

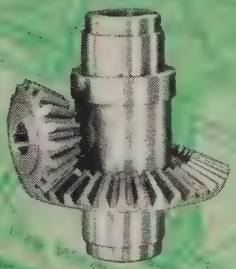
When you need gears—remember this: ILLINOIS GEAR manufactures *the most complete line of quality gears in the world.*

You can specify and buy ILLINOIS GEARS *with confidence and assurance* that they will more than satisfy your most exacting requirements.









Look for this mark ILL® *the symbol on finer gears*

ILLINOIS GEARS Reg. U.S. Pat. Off.

Gears for Every Purpose ... one gear or 10,000 or more

ILLINOIS GEAR & MACHINE COMPANY

2108 NORTH NATCHEZ AVENUE CHICAGO 35, ILLINOIS

NEW Literature

Write directly to the company for a copy

Systems Engineering

The fundamentals and reasons for draft control are discussed in this 16-page bulletin. Interlocked controls and safety devices are explained. Cleveland Fuel Equipment Co., 1111 Brookpark Road, Cleveland 9, O.

Steel Shelving

A built-in shelf-locking device is explained in this 4-page bulletin. Standard Pressed Steel Co., Box 579, Jenkintown, Pa.

Wall Chart

Decimal equivalents are shown on this 16 x 23 in. wall chart. It is printed in three colors. John Hassall Inc., Westbury, N. Y.

Metal Sheet Feeders

This 7-page bulletin describes 16 attachments for metal sheet feeders. Magnetic hold-up rolls and a brake for preventing elevator drift are among items covered. Dexter Folder Co., Pearl River, N. Y.

Tracer Lathes

Bulletin H 150, 8 pages, describes the use of tracer lathes. Cincinnati Lathe & Tool Co., Cincinnati 9, O.

Plastic Pipe

Flow charts, installation instructions, pipe characteristics and fields of application for polyvinyl chloride pipe are given in this 12-page bulletin. Alpha Plastics Inc., 78 Okner Parkway, Livingston, N. J.

Industrial Trucks

This 12-page bulletin describes trucks and attachments for various applications. Hyster Co., 2902 N.E. Clackamas St., Portland 8, Oreg.

Tools

Engineering information for tool design is included in this 56-page catalog. It shows the correct quick change holder for different types of standard metalworking machines. Beaver Tool & Engineering Corp., 500 W. County Road, Gaylord, Mich.

Self-Lubricating Bearings

Descriptions of these bearings made by powder metallurgy are given in a 6-page bulletin. Johnson Bronze Co., New Castle, Pa.

Wire

Low carbon coarse wire, high carbon fine and specialty wire, low carbon fine and specialty wire and flat and shaped wire are described in this 72-page catalog. Colorado Fuel & Iron Corp., 575 Madison Ave., New York, N. Y.

Compressors

Construction details, engineering application data and dimensions of centrifugal compressors for gas processing work are given in this 24-page bulletin, C 83. Cooper-Bessemer Corp., Mt. Vernon, O.

Drying Agent

The use of molecular sieves as drying agents for gases is described this bulletin, 20 pages. Tables and charts contain engineering data for preliminary designs of low dew point drying systems. Linde Co., division of Union Carbide Corp., 30 E. 42nd St., New York 17, N. Y.

Coremaking

Bulletin 42, 6 pages, describes the design and performance of a core blower and core shooter. Redford Iron & Equipment Co., 20733 Glendale, Detroit 23, Mich.

Drafting Machines

Equipment for the draftsman is described in this 12-page bulletin. Unitech Corp., 50 Colfax Ave., Clifton, N. J.

Plug Valve Lubricants

Lubricant recommendations for 4000 service conditions of lubricated plug valves are included in a 16-page bulletin, reference book 39, section 5A. Homestead Valve Mfg. Co., Coraopolis, Pa.

20,000-Lb Fork Truck

Specifications, operating characteristics and features of this truck are given in a 6-page brochure. Clark Equipment Co., Battle Creek, Mich.

Diameter Calibrator

This standard screw gage will calibrate wood and machine screws through size 12 and all round diameters graduated by sixteenths from 1/16 to ¼-in. in diameter. Dayton Rogers Mfg. Co., Minneapolis 7, Minn.

Water Treatment

Case histories in bulletin WDC, 2 pages, show how water treatment reduces hard deposits, congestion and corrosion in dust collectors. North American Mogul Products Co., Standard Bldg., Cleveland 13, O.

Abrasive Wheels

Bulletin GC 57 illustrates different types of cutoff wheels. Electro Refractories & Abrasives Corp., 344 Delaware Ave., Buffalo 2, N. Y.

Motor Drives

Dimensional, accessory and modification information is contained in this bulletin, M-571. Reeves Pulley Co., division of Reliance Electric & Engineering Co., 1225 7th St., Columbus, Ind.

Heavy Transformers

Regulation curves, construction features and dimensions of transformers in standard sizes from 0.050 to 5 kva are given in bulletin 300, 4 pages. Hevi-Duty Electric Co., Milwaukee 1, Wis.

Heat Treating

Heat treating fixtures including retorts, baskets, and tanks are described in this 16-page bulletin M-7. Wiretex Mfg. Co., 10 Mason St., Bridgeport, Conn.

NEW BOOKS

1957 *Canadian Trade Index,* Canadian Manufacturers' Association, 1404 Montreal Trust Bldg., 67 Yonge St., Toronto 1, Ont. 1087 pages, $10.

Over 10,000 manufacturing firms are listed in this directory. A special section discusses exports. A complete listing of manufacturers and products is included.

Machining and Grinding of Gray and Nodular (Ductile) Cast Irons, Norman Zlatin and Charles F. Walton, Gray Iron Founders' Society Inc., 930 National City-E. Sixth Bldg., Cleveland, O. 57 pages, $3.

A reference on machining and abrasive finishing, this manual presents recommended practice feeds and speeds. It includes chapters on selection of tool materials, grinding cutting tools, machining applications, machining properties and types of grinding.

Compilation of Steel Piping Materials, American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. 455 pages, $4.50.

Sixty specifications of piping materials are included in this volume. They may be used to plan systems for handling hot liquids under pressure. Topics covered include pipes; boiler, superheater and miscellaneous tubes; steel tubes; heat exchanger and condenser tubes.

STEEL

August 5, 1957

Market Outlook

STEEL buying is on the upturn. August order volume is bettering that of July, and prospects are promising that substantial tonnage for September (and later) delivery will be placed before the end of this month. The improvement is apparent in practically all products.

OPENING BOOKS—Producers of sheared plates and heavy shapes are booked full for this quarter. Sellers of bars, sheets and strip can still offer tonnage for August and September shipments. Mills generally are opening their books for fourth quarter tonnage.

OPTIMISM PREVAILS—Most product markets figure to see a pickup in order volume by late third quarter. Sheet mills report the trend in sales is favorable; at some points, demand for cold-rolled sheets is topping that for hot rolled, a decided switch from the recent buying pattern.

LOOK TO AUTOS—Sheetmakers are pinning their hopes on large-scale buying for 1958 model cars. Current purchases are in small lots for the completion of 1957 model runs. This month should see auto builders beginning to enter the market for volume tonnage.

APPLIANCES LAG—No improvement is noted in demand from the appliance manufacturers. Some observers think demand may be delayed until a month or so after the auto spurt starts. Buying interest is expected to be stimulated then by lengthening deliveries.

WIRE SLUGGISH—There is little improvement in merchant and manufacturers wire. Merchant volume has been disappointing all year. In part, this is due to intensive foreign competition—some imported products undersell the domestic market $20 to $30 a ton.

LEVELING OUT—Structural steel business is leveling out after declining several weeks. Fabricators are competing sharply for new work in an effort to bolster their sagging backlogs. Settlement of the cement strike will put new life into reinforcing steel demand.

TONNAGE DOWN—Bookings of fabricated structurals in the first half were off 21 per cent from those in the like 1956 period. The total was 1,724,752 tons, against 2,176,848. At 220,025 tons, June bookings were the lightest for the period.

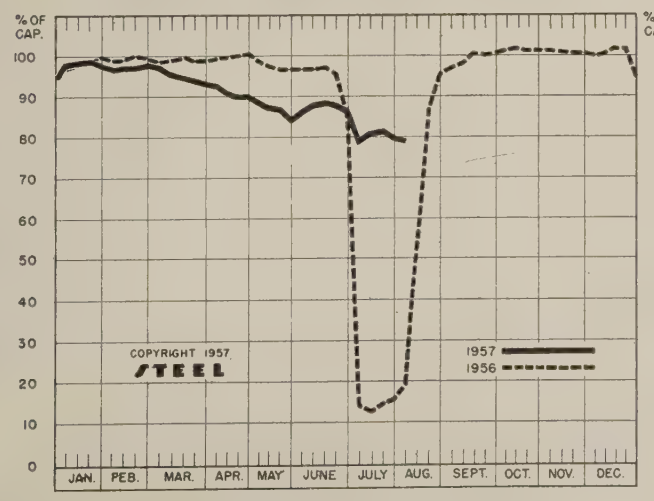
BARS MORE ACTIVE—Steel bar business is slowly moving out of its summer doldrums. Producers don't count on much improvement this month but think September will witness a definite rise in order volume.

JOBBERS HOPEFUL—July order volume on the warehouse level was down but not as much as had been expected. The distributors are confident their August business will rise in step with the resumption of operations at manufacturing plants closed for vacations.

PRODUCTION—Steelmaking operations slipped another ½-point last week. The estimated ingot rate was 79 per cent of capacity. For the past month or so, production has been hovering in the 78-81 per cent range.

PRICES—The steel price adjustment is about completed. Impact of the advances is reflected in durable finished goods. Last week, an implement maker raised its prices 7 per cent. STEEL's index on steel scrap is up $.50 to $54.50.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

	Week Ended Aug. 4	Change	Same Week 1956	Same Week 1955
Pittsburgh	85	+ 2.5*	2	94
Chicago	85.5	+ 3*	8	91
Mid-Atlantic	85.5	— 2.5	25	93
Youngstown	77	0	5	95
Wheeling	72	+ 1.5	54.5	97.5
Cleveland	77.5	+ 1.5*	0	96.5
Buffalo	88	— 2	0	105
Birmingham	85.5	— 2	3.5	21
New England	48	— 7	77	83
Cincinnati	66	+ 4*	78.5	85
St. Louis	87	+ 8	103	103.5
Detroit	91	+ 2.5*	48	86.5
Western	99	— 1	30	102
National Rate	79	— 0.5	19.5	90

INGOT PRODUCTION‡

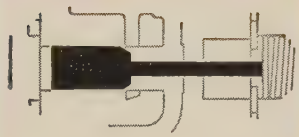
	Week Ended Aug. 4	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	130.9†	126.6	125.1	25.8
NET TONS (In thousands)	2,103†	2,033	2,009	415

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,559,490 in 1957; 2,461,893 in 1956; 2,413,278 in 1955.

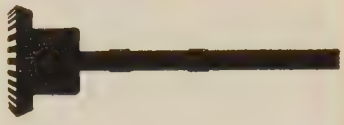
Metalworking Outlook—p. 49

Technical Outlook—p. 87

Here's a liftable idea for you in

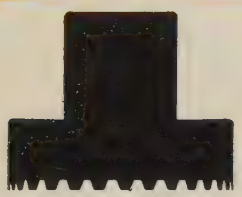


Piston for hydraulic control valve

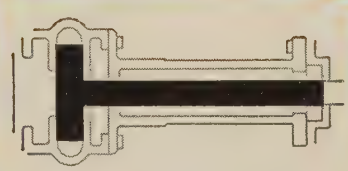


One-piece bevel gear and shaft

LARGE-HEAD STEEL FORGINGS



Spline-toothed coupling and shaft



Integral pump gear and shaft

A one-piece steel forging is probably the cost-reducing answer to many a part you now make by assembling a shaft to a thick disk or by costly machining from expensive bar stock. Above are sketched some ideas of uses for large-head steel forgings made by the Valve Division.

Advantages of one-piece extruded forgings over your present two-piece assemblies include:

Elimination of fitting and assembly,
Continuous grain structure around neck,
Only one part to machine,
Reduction in costly machining,
Elimination of costly scrap generation,
Improved structural strength,
No loosening of head on shaft.

Interested? Then let us send a Valve Division engineer to discuss the mechanics and economics of switching to large-head forgings. They are made in the same Valve Division plant that has produced over 1 billion large-head forgings as engine valves for all leading truck, automobile, aircraft, and industrial-engine builders. Write to Department ST-157 at the address below.

Valve Division *Thompson Products, Inc.*

1455 EAST 185th STREET • CLEVELAND 10, OHIO

CURRENT INVENTORIES				
UNDER 10 DAYS	10-30 DAYS	30-60 DAYS	60-90 DAYS	3-6 MONTHS
3%	22%	45%	21%	9%
5%	23%	39%	27%	6%
6%	9%	48%	23%	14%
11%	7%	49%	18%	15%
14%	16%	40%	19%	11%
11%	14%	50%	22%	3%
11%	25%	43%	21%	—
9%	15%	46%	27%	3%

Buyers Forecast 4th Qtr. Inventories

MILL PRODUCTS	LOWER	SAME	HIGHER
HOT-ROLLED CARBON BARS	22%	73%	5%
COLD-FINISHED BARS	23%	73%	4%
H & C-R SHEETS, STRIP	34%	58%	8%
LIGHT PLATES	27%	62%	11%
HEAVY PLATES	19%	64%	17%
STRUCTURAL SHAPES	17%	72%	11%
COPPER & BRASS	11%	85%	4%
ALUMINUM	19%	78%	3%

FIGURES are percentages of respondents to STEEL's quarterly survey. COLOR shows how most respondents reported.

Deliveries Are Good, Say Metal Buyers

But some report continuing trouble with wide flange beams and heavy plate. Inventories of most products remain at 30 to 60 days. Nonferrous buyers are cautious

ALTHOUGH structurals and heavy plates remain in short supply, the news about metal inventories is good. Ninety-six per cent of the respondents to STEEL's quarterly survey report that deliveries are adequate.

Structural shapes, especially wide flange beams, continue to give purchasing agents trouble. In STEEL's previous survey (May 6, p. 127), 14 per cent of the buyers reported difficulty in obtaining structurals; now, 17 per cent voice this complaint. Says one Virginia user: "We are still on strict allocation from mill sources. Owing to competitive pressure on prices, we can no longer buy from non-mill sources."

Heavy Plates Ease—In the last 90 days, the percentage of respondents indicating trouble with heavy plate deliveries declined from 20 to 14. Half the buyers have 30 to 60 day stocks (see chart), just as they did three months ago. But the situation isn't static. Eleven per cent moved into this range from the 10 to 30 day category, while 11 per cent moved out of the 30-60 range and into a 60 to 90 day position.

As the chart indicates, most fabricators have 30 to 60 day inventories of mill products. They've maintained stocks at this level since the last quarter of 1956, when they were able to replenish supplies depleted during the strike. A slight movement toward higher stocks can be detected in the report that 25 per cent of the buyers have average inventories of 60 to 90 days. Three months ago, 20 per cent reported such inventories.

No Changes Seen—Buyers seem to be well satisfied with present inventories: 70 per cent expect no changes in the fourth quarter. In the previous survey, 56 per cent forecast no changes.

Stocks of sheets and strip, both hot rolled and cold rolled, are considered excessive by 10 per cent of the purchasing agents. Higher-than-desired inventories are also reported for: Hot-rolled carbon bars (7 per cent); seamless tubing (5 per cent); cold-finished bars (3 per cent); and light plates (3 per cent). To the question, when do stocks become excessive, 46 per cent of the buyers reply: "When they reach the 60 to 90 day level."

Nonferrous Hedging—While 21 per cent of STEEL's survey participants expected to reduce their copper and brass inventories three months ago, 56 per cent did so between April and July. The explanation lies in continued price

breaks. In aluminum, too, cutbacks were more widespread than anticipated. Thirty-one per cent of the users trimmed stocks after April, although only 20 per cent had predicted such action.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 148 & 149

In May, shipments of steel shipping barrels and drums (3,115,078 units) were 3 per cent above the April movement and 14 per cent below that in May, 1956, reports the U.S. Bureau of the Census. Shipments for the first five months totaled 15,085,521 units, compared with 16,207,940 in the like 1956 period.

The movement of steel pails in May amounted to 7,068,313 units, 8 per cent above April shipments but 5 per cent below those reported for May a year ago. The movement in the first five months was 31,309,551 units, against 33,412,186 in the corresponding period of last year.

While sheet steel sellers still have tonnage available for shipment this month and are a little discouraged because August business is not coming up to earlier expectations, they are cheered over the marked gain in orders for September delivery. There is improvement in auto tonnage and miscellaneous needs, reflecting the passing of the summer doldrums and reduced consumer inventories. The demand for cold-rolled sheets is topping that for hot rolled.

Opening of mill order books for fourth quarter tonnage is adding a bit to sales volume, particularly in some specialties. It is still too early for buying for that period to reach volume proportions. Sheet demand for September, though, has been so promising that some producers have curtailed their offerings of strip-plate—it had been coming from their continuous mills for some time. Rolling time was open because of the lag in sheet requirements.

Sheet users have been eating into their stockpiles for some time. Tight money is probably limiting buying. Stocks are said to be below normal in most cases, and a build-up by late summer will be necessary, particularly if delivery promises over remainder of the year begin to lengthen.

Steel Bars . . .

Bar Prices, Page 147

Steel bar business is moving slowly out of the summer doldrums. Producers don't count on much improvement in August tonnage, but they think September volume will be substantially larger.

There are open spaces in August schedules, but the mills' principal interest at present is in September delivery tonnage. Buying is reported picking up for that month. The forward buying for September encourages considerable optimism for fourth quarter volume. Books for that period have just been opened.

Consumers' inventories are low and metalworking shops are expected to return gradually to the market for supplies.

Scattered gains in sales of cold-drawn bars to the auto builders

are noted, but there is as yet no sign of a major buying movement. A more promising sign is the reported pickup in buying of alloy bars on agricultural implement account. Orders on the books of a leading alloy producer for late third quarter shipment are already much better than they were a year ago.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 147

Demand for reinforcing steel will get a lift from the settlement of the cement workers' strike. A considerable volume of construction work has been tied up by the shortage of cement. This has meant the backing up of reinforcing bar deliveries. Also, it has discouraged the placing of new projects.

Last week the cement workers started back to work in many plants as a number of producing companies arranged settlements with the union locals. Most of the 71 cement plants idled are expected to resume full this week.

Warehouse . . .

Warehouse Prices, Page 152

Warehouse business will show some gains this month, with vacation suspensions at most metalworking plants about completed. Current demand is holding up better than had been expected some weeks ago, but it still has a way to go before it will be back to normal.

July was the poorest month of the year in both tonnage and dollar volume. This was particularly true in the Philadelphia area market where prices dipped in the face of a rise in mill quotations. At most other points warehouse price adjustments have been upward.

Small fabricators are returning to the market and expectations are that August sales will attain satisfactory volume. Actually, July business, while down, fell less than many distributors had feared. On the West Coast, the decline was about 5 per cent.

Warehouse inventories are generally in good shape. Supplies of even plates and structurals are better, though still on the short side. Flat-rolled stocks are substantial, but a pickup in buying is in early prospect.

Tubular Goods . . .

Tubular Goods Prices, Page 151

Domestic drilling of oil wells is expected to increase substantially in the second half, according to A. W. McKinney, president, National Supply Co., Pittsburgh. Stronger demand for oil country tubing should result. Sales have shown signs of leveling off in recent months owing to a combination of bad weather and heavy crude oil imports which discouraged oil prospecting.

The hope is expressed that President Eisenhower's request that oil imports be cut 10 per cent will be effected, with a resulting pickup in the drilling of new domestic wells.

Demand for mechanical and pressure tubing continues to lag. Builders of roadbuilding equipment and heavy machinery have been ordering small lots of mechanical

tubing. There are no signs of immediate improvement ahead in demand for pressure tubing which has been moving slowly.

Alloy Steel . . .

Firth Sterling Inc., Pittsburgh, has increased prices 4 per cent on high temperature alloys. Stainless steel extras, which also apply to high temperature alloys, also were raised 4 per cent.

Wire . . .

Wire Prices, Pages 149 & 150

Although there was a little improvement in the wire business in June, July volume was down more than anticipated. The dip was close to 20 per cent. So far, there is little activity from the automotive industry, but nothing had been expected before August.

The general feeling is that business will be good in the fourth quarter. Merchant wire volume has been disappointing all year. Sales were restricted in the early months because of excessive moisture in some sections, and they did not snap back when good weather came.

Another handicap: Around 60 per cent of barbed wire consumed is imported; it undersells the domestic product by $20 to $30 a ton, or about $1 a spool. The market for mesh is still good, but not as active as it was last year.

Manufacturers wire demand is expected to spurt when auto makers begin to order for their 1958 model campaigns.

Tin Plate . . .

Tin Plate Prices, Page 149

Production of tin plate continues slightly ahead of shipments, reports a major Pittsburgh area producer. Canmakers' stocks are being depleted and producers are building their inventories in anticipation of heavy requirements for packing fall crops. With corn and tomatoes to be canned in late third quarter, tin plate shipments should improve this month and continue strong through September.

Seasonal influences will probably cut requirements in November, and the fourth quarter may prove to be the slowest period of

he year. Tin plate salesmen, hough, point out that buying is ess seasonal than in some previ- us years. Major cutbacks in pro- luction during fourth quarter are ot anticipated.

Semifinished Steel . . .

Semifinished Prices, Page 147

The first of Inland Steel Co.'s three new 320-ton open-hearth furnaces at its Indiana Harbor (Ind.) Works will begin producing steel early this month. Then the company will begin the reconstruction and modernization of three of its older furnaces. In the next 12 months, Inland will repair seven furnaces built during and shortly after World War I.

Special features of the new furnaces will include firing equipment designed to burn a maximum of 1200 gallons of oil an hour. (The older ones had a maximum of 800 gallons.)

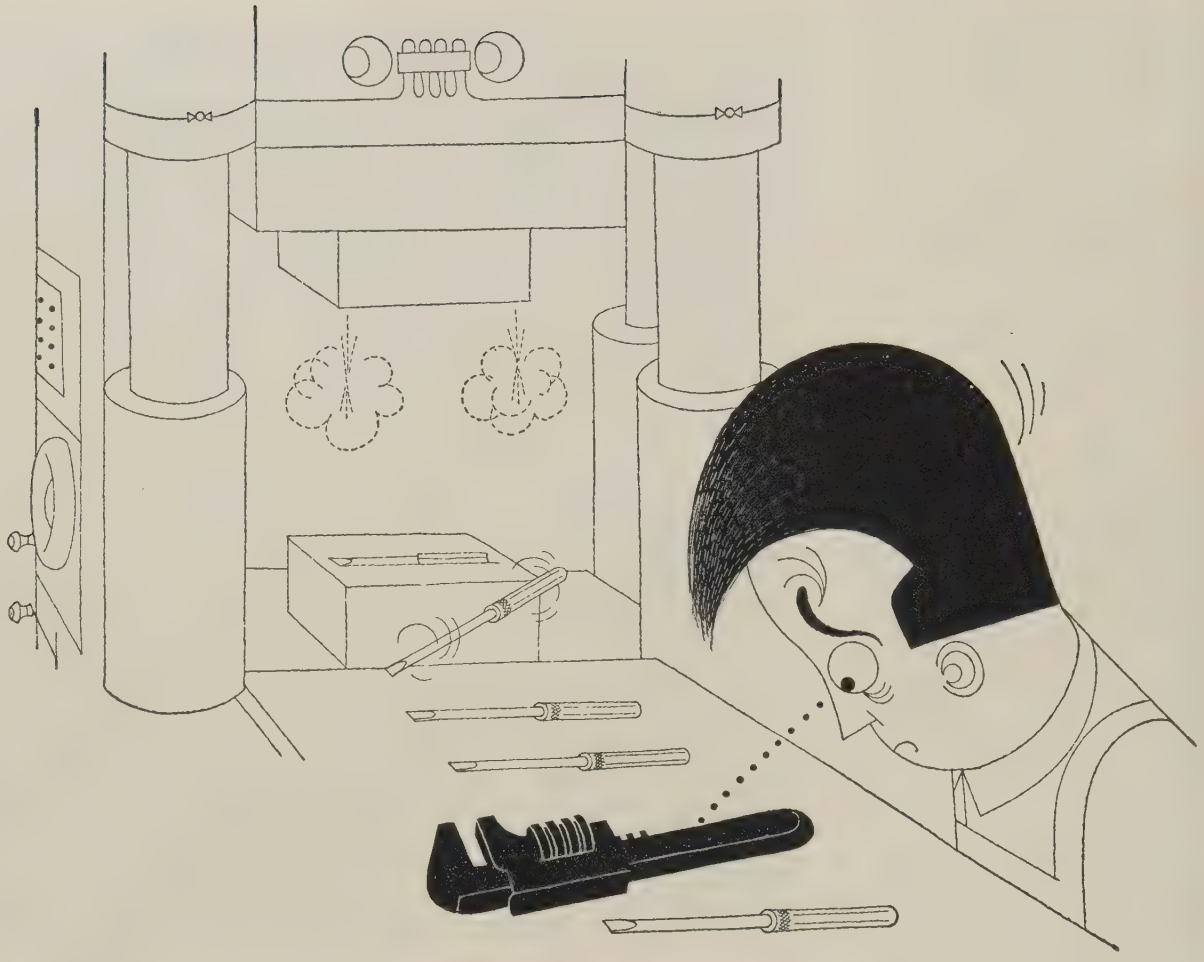
For the first time in Inland's history, its Indiana Harbor Works is running on electricity produced outside the plant. A line carrying 138,000-volt power produced at the new Dean W. Mitchell generating station of the Northern Indiana Public Service Co. was energized in mid-July. Inland generates only 25-cycle power, and the newly purchased power is 60 cycles. The No. 3 open hearth currently is the only department at the works with major equipment that operates on 60 cycles, but all electrical equipment in the current expansion program, including No. 3 cold strip and No. 4 slabbing mills and the new sintering plant, will operate on 60 cycles.

The company is buying outside power because its needs for electricity have outstripped its ability to produce it economically; any further expansion of power generating facilities would require an additional power station.

Plates . . .

Plate Prices, Page 147

Most producers of sheared plates will have a carry-over into the fourth quarter. (Some of them as much as three to four weeks.) Mechanical difficulties, labor disruptions, hot weather and mass vacations have combined to slow



Got a hot work problem?

Crucible **CHRO-MOW** hot work tool steel may be the solution. It's tough, resists wear at elevated temperatures—and you can get it quickly from local Crucible warehouses.

CHRO-MOW is an air hardening tool steel with a very desirable combination of toughness, red hardness and resistance to heat checking. That's why it's an excellent choice for hot forging dies, extrusion dies, or mandrels.

But Chro-Mow is only one of dozens of special tool steels regularly stocked at Crucible warehouses. There is a grade for each of your needs.

And, at Crucible, experienced engineers are ready with advice on selection or fabrication, when you want it. For Crucible is the only specialty steel producer *fully integrated to the point of use.* That means control and responsibility from raw material to warehouse delivery to you.

STOCKS MAINTAINED OF:

Rex High Speed Steel . . . ALL grades of Tool Steel (including Die Casting Die and Plastic Mold Steel, Drill Rod, Tool Bits, and Hollow Tool Steel Bars) . . . Stainless Steel (Sheets, Bars, Wire, Billets, Electrodes) . . . Max-el, Hy-Tuf, AISI Alloy . . . Onyx Spring, Hollow Drill Steel and other special purpose steels.

CRUCIBLE WAREHOUSE SERVICE

Crucible Steel Company of America

General Sales Offices, The Oliver Building, Mellon Square, Pittsburgh 22, Pa. Branch Offices and Warehouses: Atlanta • Baltimore Boston • Buffalo • Charlotte • Chicago • Cincinnati • Cleveland • Dallas • Dayton • Denver • Detroit • Grand Rapids Harrison • Houston • Indianapolis • Los Angeles • Milwaukee • New Haven • New York • Philadelphia • Pittsburgh • Portland, Ore. Providence • Rockford • San Francisco • Seattle • Springfield, Mass. • St. Louis • St. Paul • Syracuse • Toronto, Ont.

hipments beyond the expectations f some mills. There is little prosect they will be able to catch up n back orders before the end of he current quarter.

Constant over-all pressure for heared plates is noted. Any easng in one area of demand appears o be quickly offset by heavier deands from other consuming reas. As a result, general requirements have been running head of supplies.

Especially strong inquiry is reported from manufacturers of heavy utility equipment, such as ydraulic and steam turbines and oilers.

Eastern platemakers are opening heir books for deliveries beyond he end of this quarter. Some are n a month-to-month basis; most will accept business for the entire quarter.

The Pittsburgh area mills plan to ship as many plates this month as they did in July. September quotas will equal those for August.

Where possible, some buyers are switching from heavy gage to light gage plates which are in noticeably easier supply, even at the warehouse level. Construction firms say plates over 1-in. thick are hard to get, but the shortage is not holding back construction to any extent.

Universal plates are in fair supply. Strip-plate is more plentiful, but some tightening is anticipated in this product when the continuous mills resume volume production of sheets on automotive account for September shipment.

Structural Shapes . . .

Structural Shape Prices, Page 147

Structural steel buying has started to level off after a decline of several weeks. Whether this will lead to an upturn in demand remains to be seen. The fabricators appear none too confident of a pickup ahead, since they are still competing sharply for new work in an effort to bolster their sagging backlogs. Order books still are fairly well extended and fabricating shops continue busy.

The high rate of fabrication is reflected in continued stringency in plain structurals. Some shape

mills are four weeks or more behind on commitments. Some mills went overboard to some extent in booking tonnage in anticipation of a greater dip in specifications this summer than actually developed.

Fabricated structural steel deliveries by Boston area shops have been set back as much as a month by strikes. This comes at a time when shipment schedules have been improving as supplies of steel become freer, with the possible exception of wide flange sections.

Estimating of bridge tonnage has declined in New England. For all types of construction there is substantial variance in prices for fabrication and erection. The increase in prices on plain structurals and higher shop costs are not being passed on completely in going contracts.

On the West Coast, fabricators are marking time until strikes in the Los Angeles area are settled. Several trade unions have been off the job two or more weeks, holding up work on highway and school construction.

First-half bookings of fabricated structural steel were off 21 per cent from the corresponding period last year, reports the American Institute of Steel Construction. The total was 1,724,752 against 2,176,848 tons in the first six months of last year. June was the lightest month this year to date, bookings amounting to 220,025 tons.

The near-record June shipments of 329,256 tons pulled the midyear total up to 1,818,112 tons, a gain of 5 per cent over the like period last year. Order backlogs as of June 30 had been whittled down almost 200,000 tons since May. The total of 3,219,908 tons, though, was still 13 per cent above that for last June. During the following four months about 1,277,000 tons are slated for fabrication.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

2200 tons, 22-story office building, Sam Rudin, 40th street and Lexington avenue, New York, to Grand Iron Works, that city.

1500 tons, office building, Smith and Livingston streets, Brooklyn, N.Y., to Bethlehem Fabricators, Bethlehem, Pa.

1400 tons, state bridge work, LR 333, section 12, York county, Pennsylvania, to the Lehigh Structural Steel Co., Allentown, Pa.

900 tons, municipal pier, Brooklyn, N.Y., to White Plains Iron Works, Peekskill, N.Y.

350 tons, two highway structures, Division street project, Pawtucket, R.I., to Tower Iron Works, Providence, R.I.; Campanella & Cardi Construction Co., Hillsgrove, R.I., general contractor; steel for five other bridges let direct by the state to the same fabricator.

265 tons, addition, state reformatory, Elmira, N.Y., through F. S. Freeman and Mandell Bros., general contractors, to Bethlehem Fabricators, Bethlehem, Pa.

150 tons, factory building, Millprint Inc., Downington, Pa., to an unnamed fabricator.

125 tons, municipal service building, Philadelphia, to the Frank M. Weaver Co., Lansdale, Pa.

STRUCTURAL STEEL PENDING

3100 tons, subway work, route 112—section 2, around Christie and Delancy streets, New York, bids to be opened Aug. 16 by the New York City Transit Authority.

1023 tons, state bridge work, Nassau county, New York, bids Aug. 8.

750 tons, state bridge work, Ulster county, New York, bids Aug. 8.

150 tons, state bridge, New Kensington, Pa.; bids Aug. 16.

120 tons, state bridge work, Steuben county, New York, bids Aug. 8.

117 tons, state bridge work, Lehigh county, Pennsylvania, bids Aug. 16; this is in addition to 1171 tons of bridge work for Lehigh county, recently noted as up for bids on that date.

REINFORCING BARS . . .

REINFORCING BARS PLACED

1080 tons, seven highway structures, Division street project, Pawtucket, R.I., to Plantations Steel Co., Providence, R.I.; Campanella & Cardi Construction Co., Hillsgrove, R. I., general contractor.

500 tons, office building, International Business Machines Co., Boston, to Bethlehem Steel Co., Bethlehem, Pa.; Turner Construction Co., Boston, general contractor.

220 tons, dormitory, State Teachers College, Fitchburg, Mass., to Bethlehem Steel Co., Bethlehem, Pa.; Park Construction Co., Boston, general contractor; 30 tons, bar joists, to Cadmus Steel Co., Boston.

REINFORCING BARS PENDING

750 tons, state bridge work, LR 443 (20), Lehigh county, Pennsylvania, bids Aug. 16; 1171 tons of structural shapes also required.

467 tons, state bridge work, LR 443 (21), Lehigh county, Pennsylvania, bids Aug. 16; also required are 117 tons of structural steel.

PLATES . . .

PLATES PLACED

500 tons, 10,640 ft of 48 to 24-in. steel water pipe, for Bellingham, Wash., to Beall Tank & Pipe Co., Portland, Oreg., low at $145,820.

500 tons, 1-million-gal standpipe, Niskayuna, N.Y., to Graver Tank & Mfg. Co. Inc., East Chicago, Ind.

300 tons, floating caisson for Rocky Reach power project, Wenatchee, Wash., to Todd Shipyards Corp., Seattle, low at $195,062.

200 tons, Raritan Arsenal, Metuchen, N.J.; also 215 tons, hot-rolled sheets.

PLATES PENDING

250 tons or more, 3040 ft of 24-in. 5/16 plate, steel water pipe. Bids to the Port of Tacoma, Wash., July 24; alternatives for cast iron pipe.

PIPE . . .

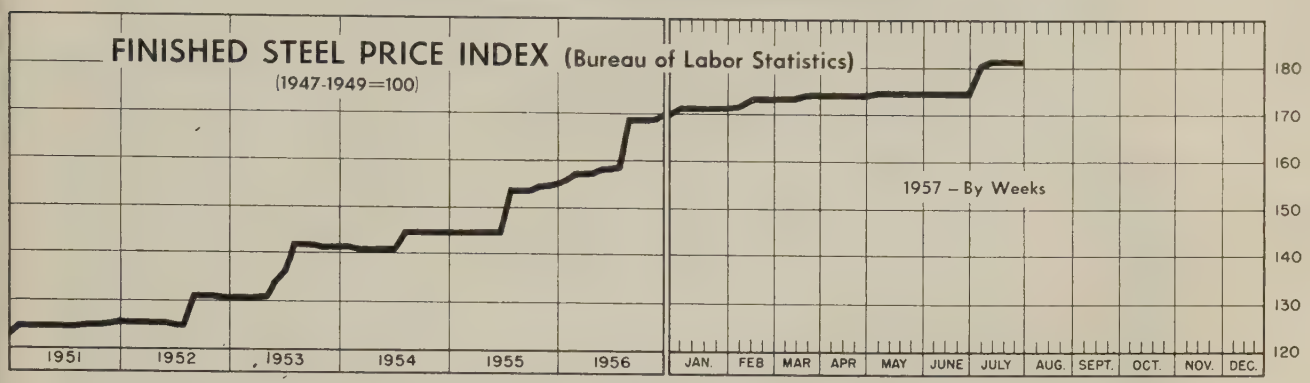
CAST IRON PIPE PLACED

800 tons, 24 to 16-in., Bellingham, Wash., to Pacific States Cast Iron Pipe Co., Seattle, at $122,597.

STEEL PIPE PLACED

800 tons, 42-in. fabricated steel pipe, Reading, Pa., to Alco Products Inc., Schenectady, N.Y.

Price Indexes and Composites



July 30, 1957	Week Ago	Month Ago	July Avg.	Year Ago
181.5	181.5	174.3	181.5	158.6

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended July 30

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Nails, Standard, No. 1...	$5.600	Bars, Reinforcing	6.210
Nails, Light, 40 lb	7.067	Bars, C.F., Carbon	10.360
Tie Plates	6.600	Bars, C.F., Alloy	13.875
Axles, Railway	9.825	Bars, C.F., Stainless, 302 (lb)	0.553
Wheels, Freight Car, 33 in. (per wheel)	60.00	Sheets, H.R., Carbon	6.192
Plates, Carbon	6.150	Sheets, C.R., Carbon	7.089
Structural Shapes	5.942	Sheets, Galvanized	8.220
Bars, Tool Steel, Carbon (lb)	0.480	Sheets, C.R., Stainless, 302 (lb)	0.688
Bars, Tool Steel, Alloy, Oil Hardening Die (lb) ...	0.585	Sheets, Electrical	12.108
Bars, Tool Steel, H.R., Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.274	Strip, C.R., Carbon.....	9.193
Bars, Tool Steel, H.R., Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.769	Strip, C.R., Stainless, 430 (lb)	0.493
Bars, H.R., Alloy	10.525	Strip, H.R., Carbon	6.245
Bars, H.R., Stainless, 303 (lb)	0.525	Pipe, Black, Buttweld (100 ft)	19.814
Bars, H.R., Carbon.....	6.425	Pipe, Galv., Buttweld (100 ft)	23.264
		Pipe, Line (100 ft)	199.023
		Casing, Oil Well, Carbon (100 ft)	194.499
		Casing, Oil Well, Alloy (100 ft)	304.610
		Tubes, Boiler (100 ft) ...	*49.130*
		Tubing, Mechanical, Carbon (100 ft)	*24.953*
		Tubing, Mechanical, Stainless, 304 (100 ft)	*205.608*
		Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)....	9.783
		Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.483
		Black Plate, Canmaking Quality (95 lb base box)	7.583
		Wire, Drawn, Carbon	10.225
		Wire, Drawn, Stainless, 430 (lb)	*0.654*
		Bale Ties (bundle)	7.967
		Nails, Wire, 8d Common.	9.828
		Wire, Barbed (80-rod spool)	8.719
		Woven Wire Fence (20-rod roll)	21.737

STEEL's FINISHED STEEL PRICE INDEX*

	July 31 1957	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)...	239.15	239.15	239.15	210.45	181.40
Index in cents per lb	6.479	6.479	6.479	5.701	4.914

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel, NT	$146.19	$146.19	$145.74	$131.27	$113.23
No. 2 Fdry Pig Iron, GT..	66.49	66.49	64.70	61.09	52.54
Basic Pig Iron, GT	65.99	65.99	64.23	60.11	52.16
Malleable Pig Iron, GT ...	67.27	67.27	65.77	61.63	53.27
Steelmaking Scrap, GT....	54.50	54.00	55.33	53.17	43.00

*For explanation of weighted index see STEEL, Sept. 19, 1949. p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	July 31 1957	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.425	5.425	5.425	4.65	3.95
Bars, H.R., Chicago	5.425	5.425	5.425	4.65	3.95
Bars, H.R., deld., Philadelphia	5.715	5.715	5.715	4.93	4.502
Bars, C.F., Pittsburgh	7.30*	7.30*	7.30*	6.25*	4.925
Shapes, Std., Pittsburgh ...	5.275	5.275	5.275	4.60	3.85
Shapes, Std., Chicago	5.275	5.275	5.275	4.60	3.85
Shapes, deld., Philadelphia..	5.585	5.585	5.585	5.00	4.13
Plates, Pittsburgh	5.10	5.10	5.10	4.50	3.90
Plates, Chicago	5.10	5.10	5.10	4.50	3.90
Plates, Coatesville, Pa.	5.50	5.50	5.50	4.80	4.35
Plates, Sparrows Point, Md.	5.10	5.10	5.10	4.50	3.90
Plates, Claymont, Del.	5.70	5.70	5.70	5.35	4.35
Sheets, H.R., Pittsburgh ...	4.925	4.925	4.925	4.325	3.775
Sheets, H.R., Chicago	4.925	4.925	4.925	4.325	3.775
Sheets, C.R., Pittsburgh ...	6.05	6.05	6.05	5.325	4.575
Sheets, C.R., Chicago	6.05	6.05	6.05	5.325	4.575
Sheets, C.R., Detroit 6.05-6.15		6.05-6.15	6.05-6.15	5.325-5.425	4.775
Sheets, Galv., Pittsburgh ...	6.60	6.60	6.60	5.85	5.075
Strip, H.R., Pittsburgh	4.925	4.925	4.925	4.325	3.75-4.00
Strip, H.R., Chicago	4.925	4.925	4.925	4.325	3.725
Strip, C.R., Pittsburgh	7.15	7.15	7.15	6.25	5.10-5.80
Strip, C.R., Chicago	7.15	7.15	7.15	6.25-6.35	5.35
Strip, C.R., Detroit	7.25	7.25	7.25	6.35	5.30-5.60
Wire, Basic, Pittsburgh....	7.65	7.65	7.65	6.60	4.85-5.225
Nails, Wire, Pittsburgh ...	8.95	8.95	8.95	7.60	5.90-6.35
Tin plate (1.50 lb)box, Pitts.	$10.30	$10.30	$10.30	$9.85	$8.95

*Including 0.35c for special quality.

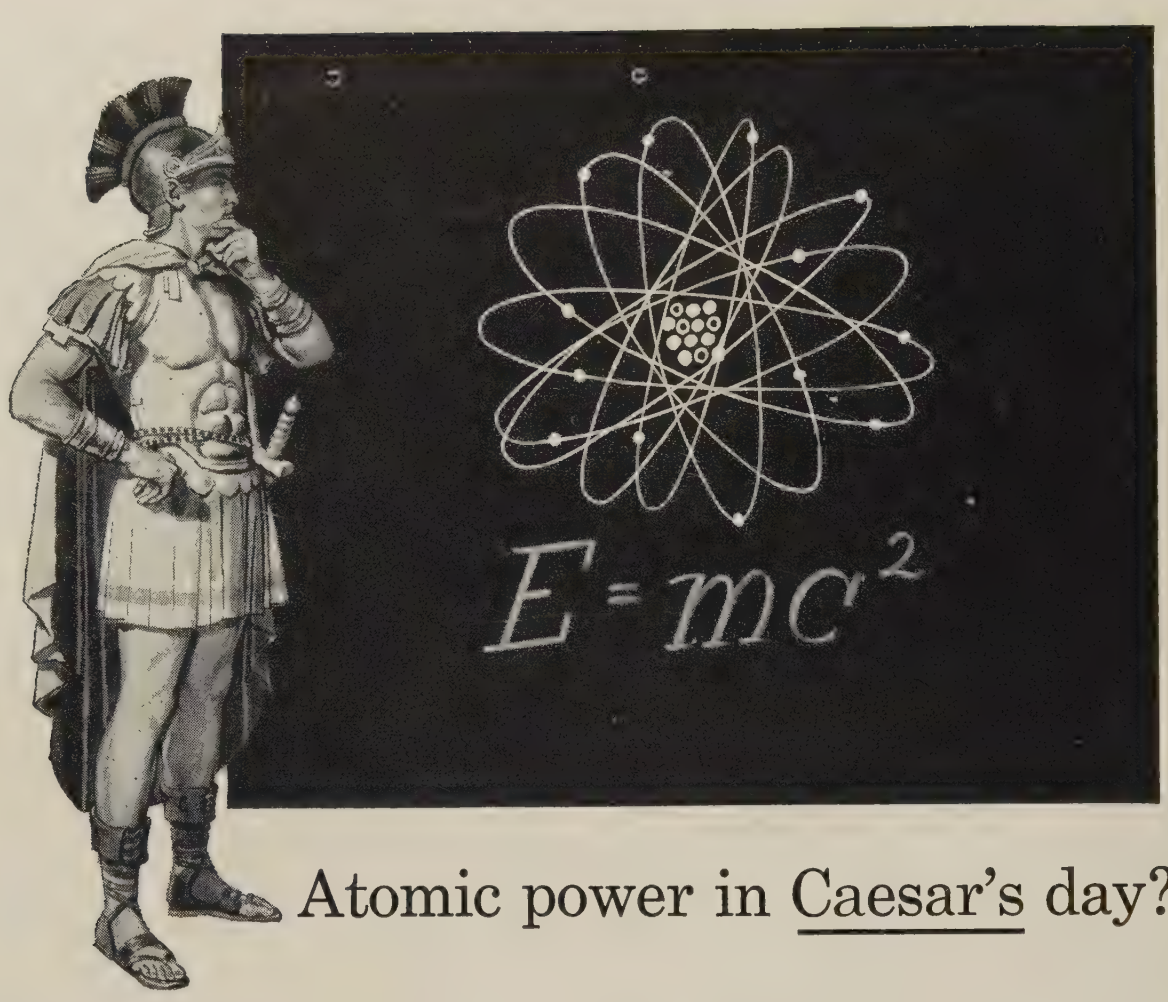
SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$96.00	$96.00	$96.00	$84.50	$70.50
Wire rods, 7/32-5/16" Pitts.....	6.15	6.15	6.15	5.375	4.325

PIG IRON, Gross Ton	July 31 1957	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pitts.	$67.00	$67.00	$65.50	$62.25	$53.00
Basic, Valley	67.00	64.50	64.50	60.00	52.00
Basic, deld., Phila.	69.88	69.88	68.38	66.26	56.75
No. 2 Fdry, NevilleIsland,Pa.	66.50	66.50	65.00	63.00	52.50
No. 2 Fdry, Chicago	66.50	66.50	65.00	61.75	52.50
No. 2 Fdry, deld., Phila. .	70.38	70.38	68.88	66.76	57.25
No. 2 Fdry, Birm.	62.50	62.50	59.00	57.00	48.88
No. 2 Fdry(Birm.)deld.Cin.	70.20	70.20	66.70	62.70	56.43
Malleable, Valley	66.50	65.00	65.00	60.50	52.50
Malleable, Chicago	66.50	66.50	65.00	61.75	52.50
Ferromanganese, Duquesne.	255.00†	255.00†	255.00†	215.00†	228.00*

†74-76% Mn, net ton. *75-82% Mn. gross ton. Etna, Pa.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pittsburgh	$56.50	$55.50	$56.50	$46.50	$44.00
No. 1 Heavy Melt, E. Pa...	53.00	53.50	56.00	50.00	41.50
No. 1 Heavy Melt, Chicago.	54.00	53.00	53.50	46.00	42.50
No. 1 Heavy Melt, Valley..	55.50	54.50	54.50	49.50	44.00
No. 1 Heavy Melt, Cleve. ..	52.50	51.50	51.50	55.50	43.00
No. 1 Heavy Melt, Buffalo.	46.50	46.50	46.50	44.50	43.00
Rails, Rerolling, Chicago ..	79.50	79.50	74.50	68.50	52.50
No. 1 Cast, Chicago	47.50	47.50	47.50	45.50	45.00

COKE, Net Ton					
Beehive, Furn., Connlsvl. ..	$15.25	$15.25	$15.25	$14.125	$14.75
Beehive, Fdry., Connlsvl. ..	18.25	18.25	18.00	16.50	17.00



Atomic power in Caesar's day?

Certainly!

It was there, in the ground, in the air and water. It always had been. There are no more "raw materials" today than there were when Rome ruled the world.

The only thing new is knowledge . . . knowledge of how to get at and rearrange raw materials. Every invention of modern times was "available" to Rameses, Caesar, Charlemagne.

In this sense, then, we have available *today* in existing raw materials the inventions that can make our lives longer, happier, and inconceivably easier. We need only *knowledge* to bring them into reality.

Could there possibly be a better argument for the strengthening of our *sources* of knowledge—our colleges and universities? Can we possibly deny that the welfare, progress—indeed the very *fate*—of our nation depends on the quality of knowledge generated and transmitted by these institutions of higher learning?

It is almost unbelievable that a society such as ours, which has profited so vastly from an accelerated accumulation of knowledge, should allow anything to threaten the wellsprings of our learning.

Yet this is the case

The crisis that confronts our colleges today threatens to weaken seriously their ability to produce the kind of graduates who can assimilate and carry forward our rich heritage of learning.

The crisis is composed of several elements: a salary scale that is driving away from teaching the kind of mind *most qualified* to teach; overcrowded classrooms; and a mounting pressure for enrollment that will *double* by 1967.

In a very real sense our personal and national progress depends on our colleges. They *must* have our aid.

Help the colleges or universities of your choice. Help them plan for stronger faculties and expansion. The returns will be greater than you think.

If you want to know what the college crisis means to you, write for a free booklet to: HIGHER EDUCATION, Box 36, Times Square Station, New York 36, New York.

HIGHER EDUCATION
KEEP IT BRIGHT

PUBLIC SERVICE ADVERTISING COUNCIL

Sponsored as a public service, in cooperation with the Council for Financial Aid to Education

Steel Prices

Mill prices as reported to STEEL, July 31, cents per pound except as otherwise noted. *Changes shown in italics.* Code numbers following mill points indicate producing company. Key to producers, page 148; to footnotes, page 150.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Sunhall,Pa. U5 .....$73.50

INGOTS, Alloy (NT)
Detroit S41 .....$77.00
Farrell,Pa. S3 .....77.00
Howellville,O. S3 .....77.00
Midland,Pa. C18 .....77.00
Sunhall,Pa. U5 .....77.00
Warren,Pa. S3 .....77.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 ....$77.50
Bridgeport,Conn. N19 ..80.50
Buffalo R2 .....77.50
Clairton,Pa. U5 .....77.50
Ensley,Ala. T2 .....77.50
Fairfield,Ala. T2 .....77.50
Fontana,Calif. K1 ....88.00
Gary,Ind. U5 .....77.50
Johnstown,Pa. B2 ....77.50
Lackawanna,N.Y. B2 ..77.50
Munhall,Pa. U5 .....77.50
S Chicago,Ill. R2, U5 ..77.50
S Duquesne,Pa. U5 ....77.50
Sterling,Ill. N15 .....77.50
Youngstown R2 .....77.50

Carbon, Forging (NT)
Bessemer,Pa. U5 ....$96.00
Bridgeport,Conn. N19..101.00
Buffalo R2 .....96.00
Canton,O. R2 .....98.50
Clairton,Pa. U5 .....96.00
Conshohocken,Pa. A3 101.00
Ensley, Ala. T2 .....96.00
Fairfield,Ala. T2 .....96.00
Fontana,Calif. K1 ....105.50
Gary,Ind. U5 .....96.00
Geneva,Utah C11 ....96.00
Houston S5 .....101.00
Johnstown,Pa. B2 .....96.00
Lackawanna,N.Y. B2 ..96.00
LosAngeles B3 .....105.50
Midland,Pa. C18 .....96.00
Munhall,Pa. U5 .....96.00
Seattle B3 .....109.50
Sharon,Pa. S3 .....96.00
S Chicago R2,U5,W14 96.00
S.Duquesne,Pa. U5 ....96.00
S.SanFrancisco B3 ...105.50
Warren,O. C17 .....96.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 ...$114.00
Bridgeport,Conn. N19..114.00
Buffalo R2 .....114.00
Canton,O. R2, T7 ....114.00
Conshohocken,Pa. A3 121.00
Detroit S41 .....114.00
Farrell,Pa. S3 .....114.00
Fontana,Calif. K1 ....135.00
Gary,Ind. U5 .....114.00
Houston S5 .....119.00
Ind.Harbor,Ind. Y1 ...114.00
Johnstown,Pa. B2 ....114.00
Lackawanna,N.Y. B2 114.00
LosAngeles B3 .....134.00
Lowellville,O. S3 ....114.00
Massillon,O. R2 .....114.00
Midland,Pa. C18 .....114.00
Munhall,Pa. U5 .....114.00
Sharon,Pa. S3 .....114.00
S.Chicago R2,U5,W14 114.00
S.Duquesne,Pa. U5 ...114.00
Struthers,O. Y1 .....114.00
Warren,O. C17 .....114.00

ROUNDS, SEAMLESS TUBE (NT)
Bridgeport,Conn. N19.$122.50
Buffalo R2 .....117.50
Canton,O. R2 .....120.00
Cleveland,O. R2 .....117.50
Gary,Ind. U5 .....117.50
S.Chicago,Ill. R2, W14 117.50
S.Duquesne,Pa. U5 ..117.50
Warren,O. C17 .....117.50

SKELP
Aliquippa,Pa. J5 .....5.075
BoneStar,Tex. L6 ....5.025
Munhall,Pa. U5 .....4.875
Warren,O. R2 .....4.875
Youngstown R2, U5 ..4.875

WIRE RODS
AlabamaCity,Ala. R2 ..6.15
Aliquippa,Pa. J5 .....6.15
Alton,Ill. L1 .....6.35
Buffalo W12 .....5.80
Cleveland A7 .....6.15
Donora,Pa. A7 .....6.15
Fairfield,Ala. T2 .....6.15
Houston S5 .....6.40
IndianaHarbor,Ind. Y1..6.15
Johnstown,Pa. B2 .....6.15
Joliet,Ill. A7 .....6.15
KansasCity,Mo. S5 .....6.40
Kokomo,Ind. C16 .....6.25
LosAngeles B3 .....6.95
Minnequa,Colo. C10 ....6.40
Monessen,Pa. P17 .....6.15
N.Tonawanda,N.Y. B11..6.15
Pittsburg,Calif. C11 ....6.95
Portsmouth,O. P12 .....6.15
Roebling,N.J. R5 .....6.25
S.Chicago,Ill. R2 .....6.15
SparrowsPoint,Md. B2 ..6.25
Sterling,Ill.(1) N15 ....6.15
Sterling,Ill. N15 .....6.25
Struthers,O. Y1 .....6.15
Worcester,Mass. A7 ....6.45

STRUCTURALS

Carbon Steel Std. Shapes
Ala.City,Ala. R2 ....5.275
Atlanta A11 .....5.475
Aliquippa,Pa. J5 .....5.275
Bessemer,Ala. T2 .....5.275
Bethlehem,Pa. B2 ....5.325
Birmingham C15 .....5.275
Clairton,Pa. U5 .....5.275
Fairfield,Ala. T2 .....5.275
Fontana,Calif. K1 ....6.025
Gary,Ind. U5 .....5.275
Geneva,Utah C11 .....5.275
Houston S5 .....5.375
Ind.Harbor,Ind. I-2 ..5.275
Johnstown,Pa. B2 ....5.325
Joliet,Ill. P22 .....5.275
KansasCity,Mo. S5 ....5.375
Lackawanna,N.Y. B2 ..5.325
LosAngeles B3 .....5.975
Minnequa,Colo. C10 ...5.575
Munhall,Pa. U5 .....5.275
Niles,Calif. P1 .....5.925
Phoenixville,Pa. P4 ....5.50
Portland,Oreg. O4 ....6.025
Seattle B3 .....6.025
S.Chicago,Ill. U5, W14 5.275
S.SanFrancisco B3 ....5.925
Sterling,Ill. N15 .....5.275
Torrance,Calif. C11 ....5.975
Weirton,W.Va. W6 ....5.275

Wide Flange
Bethlehem,Pa. B2 ...5.325
Clairton,Pa. U5 .....5.275
Fontana,Calif. K1 ....6.225
IndianaHarbor,Ind. I-2 5.525
Lackawanna,N.Y. B2 ..5.325
Munhall,Pa. U5 .....5.275
Phoenixville,Pa. P4 ....5.50
S.Chicago,Ill. U5 .....5.275

Alloy Std. Shapes
Aliquippa,Pa. J5 .....6.55
Clairton,Pa. U5 .....6.55
Gary,Ind. U5 .....6.55
Houston S5 .....6.65
Munhall,Pa. U5 .....6.55
S.Chicago,Ill. U5 .....6.55

H.S., L.A. Std. Shapes
Aliquippa,Pa. J5 .....7.75
Bessemer,Ala. T2 .....7.75
Bethlehem,Pa. B2 .....7.80
Clairton,Pa. U5 .....7.75
Fairfield,Ala. T2 .....7.75
Fontana,Calif. K1 .....8.50
Gary,Ind. U5 .....7.75
Geneva,Utah C11 .....7.75
Houston S5 .....7.85
Ind.Harbor,Ind. I-2, Y1 7.75
Johnstown,Pa. B2 .....7.80
KansasCity,Mo. S5 ....7.85
Lackawanna,N.Y. B2 ..7.80
LosAngeles B3 .....8.45
Munhall,Pa. U5 .....7.75
Seattle B3 .....8.50
S.Chicago,Ill. U5, W14..7.75
S.SanFrancisco B3 ....8.40
Struthers,O. Y1 .....7.75

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....7.80
Lackawanna,N.Y. B2 ..7.80
Munhall,Pa. U5 .....7.75
S.Chicago,Ill. U5 .....7.75

PILING

BEARING PILES
Bethlehem,Pa. B2 ....5.325
Lackawanna,N.Y. B2 .5.325
Munhall,Pa. U5 .....5.275
S.Chicago,Ill. U5 .....5.275

STEEL SHEET PILING
Lackawanna,N.Y. B2 ..6.225
Munhall,Pa. U5 .....6.225
S.Chicago,Ill. U5 .....6.225

PLATES

PLATES, Carbon Steel
Ala.City,Ala. R2 .....5.10
Aliquippa,Pa. J5 .....5.10
Ashland,Ky. (15) A10 5.10
Bessemer,Ala. T2 .....5.10
Clairton,Pa. U5 .....5.10
Claymont,Del. C22 ....5.70
Cleveland J5, R2 .....5.20
Coatesville,Pa. L7 .....5.50
Conshohocken,Pa. A3 ..5.20
Ecorse,Mich. G5 .....5.20
Fairfield,Ala. T2 .....5.10
Fontana,Calif.(30) K1 ..5.85
Gary,Ind. U5 .....5.10
Geneva,Utah C11 .....5.10
GraniteCity,Ill. G4 .....5.30
Harrisburg,Pa. P4 .....5.80
Houston S5 .....5.20
Ind.Harbor,Ind. I-2, Y1 5.10
Johnstown,Pa. B2 .....5.10
Lackawanna,N.Y. B2 ..5.10
LoneStar,Tex. L6 .....5.45
Mansfield,O. E6 .....5.10
Minnequa,Colo. C10 ...5.95
Munhall,Pa. U5 .....5.10
Newport,Ky. A2 .....5.10
Pittsburgh J5 .....5.10
Riverdale, Ill. A1 .....5.10
Seattle B3 .....6.00
Sharon,Pa. S3 .....5.10
S.Chicago,Ill. U5, W14 5.10
SparrowsPoint,Md. B2 ..5.10
Sterling,Ill. N15 .....5.10
Steubenville,O. W10 ....5.10
Warren,O. R2 .....5.10
Youngstown R2, U5, Y1.5.10

PLATES, Carbon Abras. Resist.
Claymont,Del. C22 ....7.35
Fontana,Calif. K1 .....7.50
Geneva, Utah C11 ....6.75
Johnstown,Pa. B2 .....7.00
SparrowsPoint,Md. B2 .7.00

PLATES, Wrought Iron
Economy,Pa. B14 .....13.15

PLATES, H.S., L.A.
Aliquippa,Pa. J5 .....7.625
Bessemer,Ala. T2 .....7.625
Clairton,Pa. U5 .....7.625
Claymont,Del. C22 ....7.625
Cleveland J5, R2 ....7.625
Coatesville,Pa. L7 ....7.55
Conshohocken,Pa. A3..7.625
Ecorse,Mich. G5 .....7.725
Fairfield,Ala. T2 .....7.625
Farrell,Pa. S3 .....7.625
Fontana,Calif.(30) K1. 8.375
Gary,Ind. U5 .....7.625
Geneva,Utah C11 .....7.625
Houston S5 .....7.725
Ind.Harbor,Ind. I-2, Y1 7.625
Johnstown,Pa. B2 ....7.625
Lackawanna,N.Y. B2 ..7.625
Munhall,Pa. U5 .....7.625
Pittsburgh J5 .....7.625
Seattle B3 .....8.525
Sharon,Pa. S3 .....7.625
S.Chicago,Ill. U5, W14 7.625
SparrowsPoint,Md. B2 7.625
Warren,O. R2 .....7.625
Youngstown U5 .....7.625

PLATES, Alloy
Aliquippa,Pa. J5 .....7.20
Claymont,Del. C22 .....7.20
Coatesville,Pa. L7 .....7.20
Farrell,Pa. S3 .....7.20
Fontana,Calif.(30) K1..7.95
Gary,Ind. U5 .....7.20
Houston S5 .....7.30
Ind.Harbor,Ind. Y1 ....7.20
Johnstown,Pa. B2 .....7.20
Lowellville,O. S3 .....7.20
Munhall,Pa. U5 .....7.20
Newport,Ky. A2 .....7.20
Pittsburgh J5 .....7.20
Seattle B3 .....8.10
Sharon,Pa. S3 .....7.20
S.Chicago,Ill. U5, W14 7.20
SparrowsPoint,Md. B2 .7.20
Youngstown Y1 .....7.20

FLOOR PLATES
Cleveland J5 .....6.175
Conshohocken,Pa. A3 ..6.175
Harrisburg,Pa. P4 ....6.275
Ind.Harbor,Ind. I-2 ..6.175
Munhall,Pa. U5 .....6.175
S.Chicago,Ill. U5 .....6.175

PLATES, Ingot Iron
Ashland c.l. (15) A10..5.35
Ashland l.c.l. (15) A10..5.85
Cleveland c.l. R2 .....5.85
Warren,O. c.l. R2 .....5.85

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)
Ala.City,Ala.(9) R2 ..5.425
Aliquippa,Pa.(9) J5 ....5.425
Alton,Ill. L1 .....5.625
Atlanta(9) A11 .....5.625
Bessemer,Ala.(9) T2 ..5.425
Birmingham(9) C15 ..5.425
Bridgeport,Conn.(9) N19 5.65
Buffalo(9) R2 .....5.425
Clairton,Pa.(9) U5 ....5.425
Cleveland(9) R2 .....5.425
Ecorse,Mich.(9) G5 ....5.525
Emeryville,Calif. J7 ...6.175
Fairfield,Ala.(9) T2 ..5.425
Fairless,Pa.(9) U5 ....5.575
Fontana,Calif.(9) K1 ..6.125
Gary,Ind.(9) U5 .....5.425
Houston(9) S5 .....5.675
Ind.Harbor(9) I-2, Y1 5.425
Johnstown,Pa.(9) B2 ..5.425
Joliet,Ill. P22 .....5.425
KansasCity,Mo.(9) S5..5.675
Lackawanna(9) B2 ....5.425
LosAngeles(9) B3 .....6.125
Milton,Pa. M18 .....5.575
Minnequa,Colo. C10 ...5.875
Niles,Calif. P1 .....6.125
N.T'wanda,N.Y.(46)B11 5.775
Pittsburg,Calif.(9) C11 6.125
Pittsburgh(9) J5 .....5.425
Portland,Oreg. O4 ....6.175
Seattle B3, N14 .....6.175
S.Ch'c'go(9)R2,U5,W14 5.425
S.Duquesne,Pa.(9) U5 .5.425
S.SanFran.,Calif.(9)B3 6.175
Sterling,Ill.(1)(9) N15..5.425
Sterling,Ill.(9) N15 ....5.525
Struthers,O. Y1 .....5.425
Tonawanda,N.Y. B12 ..5.425
Torrance,Calif.(9) C11 6.125
Youngstown(9) R2, U5 5.425

BARS, H.R. Leaded Alloy
(Including leaded extra)
Warren,O. C17 .....7.475

BARS, Hot-Rolled Alloy
Aliquippa,Pa. J5 .....6.475
Bethlehem,Pa. B2 ....6.475
Bridgeport,Conn. N19 ..6.55
Buffalo R2 .....6.475
Canton,O. R2, T7 .....6.475
Clairton,Pa. U5 .....6.475
Detroit S41 .....6.475
Ecorse,Mich. G5 .....6.575
Fairless,Pa. U5 .....6.625
Farrell,Pa. S3 .....6.475
Fontana,Calif. K1 ....7.525
Gary,Ind. U5 .....6.475
Houston S5 .....6.725
Ind.Harbor,Ind. I-2, Y1 6.475
Johnstown,Pa. B2 ....6.475
KansasCity,Mo. S5 ....6.725
Lackawanna,N.Y. B2 ..6.475
Lowellville,O. S3 .....6.475
LosAngeles B3 .....7.525
Massillon,O. R2 .....6.475
Midland,Pa. C18 .....6.475
Pittsburgh J5 .....6.475
Sharon,Pa. S3 .....6.475
S.Chicago R2, U5, W14 6.475
S.Duquesne,Pa. U5 ....6.475
Struthers,O. Y1 .....6.475
Warren,O. C17 .....6.475
Youngstown U5 .....6.475

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy
Aliquippa,Pa. J5 .....7.925
Bessemer,Ala. T2 .....7.925
Bethlehem,Pa. B2 .....7.925
Bridgeport,Conn. N19 ..7.95
Clairton,Pa. U5 .....7.925
Cleveland R2 .....7.925
Ecorse,Mich. G5 .....8.025
Fairfield,Ala. T2 .....7.925
Fontana,Calif. K1 ....8.625
Gary,Ind. U5 .....7.925
Houston S5 .....8.175
Ind.Harbor,Ind. Y1 ...7.925
Johnstown,Pa. B2 .....7.925
KansasCity,Mo. S5 ....8.175
Lackawanna,N.Y. B2 ..7.925
LosAngeles B3 .....8.625
Pittsburgh J5 .....7.925
Seattle B3 .....8.675
S.Chicago,Ill. U5, W14 7.925
S.Duquesne,Pa. U5 ....7.925
S.SanFrancisco B3 ....8.675
Struthers,O. Y1 .....7.925
Youngstown U5 .....7.925

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa.(9) B2 ..5.575
Houston(9) S5 .....5.675
KansasCity,Mo.(9) S5..5.675
Lackawanna(9) B2 ....5.425
Sterling,Ill. N15 .....5.525
Sterling,Ill.(1) N15 ...5.425
Tonawanda,N.Y. B12 ..5.425

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....5.425
Atlanta A11 .....5.625
Joliet,Ill. P22 .....5.425
Niles,Calif. P1 .....6.125
Pittsburgh J5 .....5.425
Portland,Oreg. O4 ....6.175
SanFrancisco S7 .....6.275
Seattle B3 .....6.175

BAR SHAPES, Hot-Rolled Alloy
Aliquippa,Pa. J5 .....6.55
Clairton,Pa. U5 .....6.55
Gary,Ind. U5 .....6.55
Houston S5 .....6.80
KansasCity,Mo. S5 .....6.80
Pittsburgh J5 .....6.55
Youngstown U5 .....6.55

BARS, C.F., Leaded Alloy (Including leaded extra)
Ambridge,Pa. W18 ...9.925
BeaverFalls,Pa. M12 ..9.925
Camden,N.J. P13 .....10.10
Chicago W18 .....9.925
Cleveland C20 .....9.475
LosAngeles P2, S30
(Gr. A) 11.30
(Gr. B) 11.80
Monaca,Pa. S17 .....9.925
Newark,N.J. W18 .....10.10
SpringCity,Pa. K3 .....10.10
Warren,O. C17 .....9.925

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....7.30
BeaverFalls,Pa. M12,R2 7.30
Birmingham C15 .....7.90
Bridgeport,Conn. N19 ..7.65
Buffalo B5 .....7.85
Camden,N.J. P13 .....7.75
Carnegie,Pa. C12 .....7.30
Chicago W18 .....7.30
Cleveland A7, C20 .....7.30
Detroit B5, P17 .....7.50
Detroit S41 .....7.30
Donora,Pa. A7 .....7.30
Elyria,O. W8 .....7.30
FranklinPark,Ill. N5 ..7.30
Gary,Ind. R2 .....7.30
GreenBay,Wis. F7 .....7.30
Hammond,Ind. J5, L2..7.30
Hartford,Conn. R2 .....7.80
Harvey,Ill. B5 .....7.30
LosAngeles P2, S30 ....8.75
LosAngeles R2 .....8.75
Mansfield,Mass. B5 ....7.85
Massillon,O. R2, R8 ....7.30
Midland,Pa. C18 .....7.30
Monaca,Pa. S17 .....7.30
Newark,N.J. W18 .....7.75
NewCastle,Pa.(17) B4 ..7.30
Pittsburgh J5 .....7.30
Plymouth,Mich. P5 ....7.55
Putnam,Conn. W18 ....7.85
Readville,Mass. C14 ...7.85
S.Chicago,Ill. W14 .....7.30
SpringCity,Pa. K3 .....7.75
Struthers,O. Y1 .....7.30
Warren,O. C17 .....7.30
Willimantic Conn. J5 ...7.80
Waukegan,Ill. A7 .....7.30
Youngstown F3, Y1 ....7.30

BARS, Cold-Finished Carbon (Turned and Ground)
Cumberland,Md.(5) C19.6.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....8.775
BeaverFalls,Pa.M12,R2 8.775
Bethlehem,Pa. B2 .....8.775
Bridgeport,Conn. N19 ..8.925
Buffalo B5 .....8.775
Camden,N.J. P13 .....8.95
Canton,O. T7 .....8.775
Carnegie,Pa. C12 .....8.775
Chicago W18 .....8.775
Cleveland A7, C20 ....8.775
Detroit B5, P17 .....8.975
Detroit S41 .....8.775
Donora,Pa. A7 .....8.775
Elyria,O. W8 .....8.775
FranklinPark,Ill. N5 ...8.775
Gary,Ind. R2 .....8.775
GreenBay,Wis. F7 ....8.775
Hammond,Ind. J5, L2..8.775
Hartford,Conn. R2 ....9.075
Harvey,Ill. B5 .....8.775
Lackawanna,N.Y. B2 ..8.775
Los Angeles P2, S30...10.65
Mansfield,Mass. B5 ...9.075
Massillon,O. R2, R8 ...8.775
Midland,Pa. C18 .....8.775
Monaca,Pa. S17 .....8.775
Newark,N.J. W18 .....8.95
Plymouth,Mich. P5 ...8.975
S.Chicago W14 .....8.775
SpringCity,Pa. K3 .....8.95
Struthers,O. Y1 .....8.775
Warren,O. C17 .....8.775
Waukegan,Ill. A7 .....8.775
Worcester,Mass. A7 ...9.075
Youngstown F3, Y1 ..8.775

BARS, Reinforcing (To Fabricators)

Ala.City,Ala. R2 .....5.425
Atlanta A11 .....5.625
Birmingham C15 .....5.425
Bridgeport,Conn. N19 ...5.65
Buffalo R2 .....5.425
Cleveland R2 .....5.425
Ecorse,Mich. G5 .....5.775
Emerysville,Calif. J7 ..6.175
Fairfield,Ala. T2 .....5.425
Fairless,Pa. U5 .....5.575
Fontana,Calif. K1 ....6.125
Ft.Worth,Tex.(4)(26)T4 5.875
Gary,Ind. U5 .....5.425
Houston S5 .....5.675
Ind.Harbor,Ind. I-2,Y1 5.425
Johnstown,Pa. B2 ....5.425
Joliet,Ill. P22 .....5.425
KansasCity,Mo. S5 ....5.675
Lackawanna,N.Y. B2 ..5.425
LosAngeles B3 .....6.125
Milton,Pa. M18 .....5.575
Minnequa,Colo. C10 ...5.875
Niles,Calif. P1 .....6.125
Pittsburg,Calif. C11 ..6.125
Pittsburgh J5 .....5.425
Portland,Oreg. O4 ....6.175
SandSprings,Okla. S5 ..5.925
Seattle B3, N14 .....6.175
S.Chicago,Ill. R2 .....5.425
S.Duquesne,Pa. U5 ....5.425
S.SanFrancisco B3 ....6.175
SparrowsPoint,Md. B2..5.425
Sterling,Ill.(1) N15 ...5.425
Sterling,Ill. N15 .....5.525
Struthers,O. Y1 .....5.425
Tonawanda,N.Y. B12 ..6.00
Torrance,Calif. C11 ....6.125
Youngstown R2, U5 ..5.425

BARS, Reinforcing (Fabricated; to Consumers)

Boston B2 .....7.65
Chicago U8 .....6.91
Cleveland U8 .....6.89
Johnstown,Pa. B2 .....7.08
KansasCity,Mo. S5 .....7.35
Lackawanna,N.Y. B2 ..6.85
Marion,O. P11 .....6.70
Newark,N.J. U8 .....7.55
Philadelphia B2 .....7.38
Pittsburgh J5, U8 .....7.10
Seattle B3, N14 .....7.70
SparrowsPt.,Md. B2 ...7.08
Williamsport,Pa. S19 ...7.00

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 14.45
Economy,Pa.(D.R.)B14 18.00
Economy(Staybolt)B14 .18.45

RAIL STEEL BARS

ChicagoHts.(3) C2, I-2 .5.325
ChicagoHts.(4)(44) I-2..5.425
ChicagoHts.(4) C2 ... 5.425
Ft.Worth,Tex.(26) T4..5.875
Franklin,Pa.(3) F5 ...5.325
Franklin,Pa.(4) F5 ...5.425
JerseyShore,Pa.(4) J8 ..5.10
Marion,O.(3) P11 .....5.325
Tonawanda(3) R12 ....5.325
Tonawanda(4) B12 .....6.00
Williamsport, Pa.(3)S19 5.50

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

Ala.City,Ala. R2 .....4.925
Allenport,Pa. P7 .....4.925
Ashland,Ky.(8) A10 ..4.925
Cleveland J5, R2 ....4.925
Conshohocken,Pa. A3 ..4.975
Detroit(8) M1 .....5.025
Ecorse,Mich. G5 .....5.025
Fairfield,Ala. T2 ....4.925
Fairless,Pa. U5 .....4.975
Fontana,Calif. K1 ....5.775
Gary,Ind. U5 .....4.925
Geneva,Utah C11 ....5.025
GraniteCity,Ill.(8) G4..5.125
Ind.Harbor,Ind. I-2, Y1 4.925
Irvin,Pa. U5 ..... 4.925
Lackawanna,N.Y. B2 ..4.925
Mansfield,O. E6 .....4.925
Munhall,Pa. U5 .....4.925
Newport,Ky.(8) A2 ...4.925
Niles,O. M21, S3 .....4.925
Pittsburg,Calif. C11 ..5.625
Pittsburgh J5 .....4.925
Portsmouth,O. P12 ....4.925
Riverdale,Ill. A1 ....4.925
Sharon,Pa. S3 .....4.925
S.Chicago,Ill. W14 ....4.925
SparrowsPoint,Md. B2..4.925
Steubenville,O. W10 ...4.925
Warren,O. R2 .....4.925
Weirton,W.Va. W6 ....4.925
Youngstown U5, Y1..4.925

SHEETS, H.R., (19 Ga.& Lighter)

Niles,O. M21 .....6.05

SHEETS, H.R. Alloy

Gary,Ind. U5 .....8.10
Ind.Harbor,Ind. Y1 ....8.10
Irvin,Pa. U5 .....8.10
Munhall,Pa. U5 .....8.10
Newport,Ky. A2 .....8.10
Youngstown U5, Y1 ....8.10

SHEETS, H.R. (14 Ga.& Heavier) High-Strength, Low-Alloy

Cleveland J5, R2 ....7.275
Conshohocken,Pa. A3..7.325
Ecorse,Mich. G5 .....7.375
Fairfield,Ala. T2 ....7.275
Fairless,Pa. U5 .....7.325
Farrell,Pa. S3 .....7.275
Fontana,Calif. K1 ....8.125
Gary,Ind. U5 .....7.275
Ind.Harbor,Ind. I-2,Y1 7.275
Irvin,Pa. U5 .....7.275
Lackawanna(35) B2 ..7.275
Munhall,Pa. U5 .....7.275
Pittsburgh J5 .....7.275
S.Chicago,Ill. U5,W14 7.275
Sharon,Pa. S3 .....7.275
SparrowsPoint(36) B2..7.275
Warren,O. R2 .....7.275
Weirton,W.Va. W6 ....7.275
Youngstown U5, Y1 ..7.275

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ..5.175
Cleveland R2 .....5.675
Warren,O. R2 .....5.675

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....6.80
Middletown,O. A10 ....6.55
Warren,O. R2 .....6.80

SHEETS, Cold-Rolled Steel (Commercial Quality)

Allenport,Pa. P7 .....6.05
Cleveland J5, R2 .....6.05
Conshohocken,Pa. A3 ..6.10
Detroit M1 .....6.05
Ecorse,Mich. G5 .....6.15
Fairfield,Ala. T2 .....6.05
Fairless,Pa. U5 .....6.10
Follansbee,W.Va. F4 ...6.05
Fontana,Calif. K1 .....7.30
Gary,Ind. U5 .....6.05
GraniteCity,Ill. G4 .....6.25
Ind.Harbor,Ind. I-2, Y1 6.05
Irvin,Pa. U5 .....6.05
Lackawanna,N.Y. B2 ..5.75
Mansfield,O. E6 .....6.05
Middletown,O. A10 ....6.05
Newport,Ky. A2 .....6.05
Pittsburg,Calif. C11 ....7.00
Pittsburgh J5 .....6.05
Portsmouth,O. P12 .....6.05
SparrowsPoint,Md. B2 . 5.75
Steubenville,O. W10 ....6.05
Warren,O. R2 .....6.05
Weirton,W.Va. W6 ....6.05
Yorkville,O. W10 .....6.05
Youngstown Y1 .....6.05

SHEETS, Cold-Rolled High-Strength, Low-Alloy

Cleveland J5, R2 .....8.975
Ecorse,Mich. G5 .....9.075
Fairless,Pa. U5 .....9.025
Fontana,Calif. K1 ...10.275
Gary,Ind. U5 .....8.975
IndianaHarbor,Ind. Y1 8.975
Irvin,Pa. U5 .....8.975
Lackawanna(37) B2 ..8.975
Pittsburgh J5 .....8.975
SparrowsPoint(38) B2 8.975
Warren,O. R2 .....8.975
Weirton,W.Va. W6 ....8.975
Youngstown Y1 .....8.975

SHEETS, Culvert

	Cu	Cu Fe
Ashland,Ky. A10	6.95	7.20
Canton,O. R2	6.95	7.45
Fairfield T2	6.95	7.20
Gary,Ind. U5	6.95	7.20
GraniteCity,Ill. G4	7.15	...
Ind.Harbor I-2	6.95	7.20
Irvin,Pa. U5	6.95	7.20
Kokomo,Ind. C16	7.05	...
MartinsFry. W10	6.95	7.20
Pittsburgh J5	6.65	...
Pitts.,Calif. C11	7.70	...
SparrowsPt. B2	6.95	...

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 ... 7.20

SHEETS, Galvanized Steel Hot-Dipped

Ala.City,Ala. R2 .....6.60‡
Ashland,Ky. A10 ....6.60†
Canton,O. R2 .....6.60‡
Dover,O. R1 .....6.60†
Fairfield,Ala. T2 .....6.60†
Gary,Ind. U5 .....6.60*
GraniteCity,Ill. G4 ....6.80*
Ind.Harbor,Ind. I-2 ...6.60†
Irvin,Pa. U5 .....6.60*
Kokomo,Ind. C16 .....6.70‡
MartinsFerry,O. W10 .6.60*
Middletown,O. A10 ..6.60†
Pittsburg,Calif. C11 ..7.35*
Pittsburgh J5 .....6.60†
SparrowsPt.,Md. B2 ...6.60†
Warren,O. R2 .....6.60†
Weirton,W.Va. W6 ....6.60*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....7.27

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5 .....9.72
SparrowsPt.(39) B2 ...9.72

SHEETS, Galvannealed Steel

Canton,O. R2 .....7.0
Irvin,Pa. U5 .....7.0

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10 .....6.8
Middletown,O. A10 ....6.8

SHEETS, Electrogalvanized

Cleveland(28) R2 .....7.42
Niles,O.(28) R2 .....7.42
Weirton,W.Va. W6 ....7.27

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1) .9.2
Butler,Pa. A10 (type 2) .9.3

SHEETS, Enameling Iron

Ashland,Ky. A10 ....6.62
Cleveland R2 .....6.62
Gary,Ind. U5 .....6.62
GraniteCity,Ill. G4 ....6.82
Ind.Harbor,Ind. I-2,Y1 6.62
Irvin,Pa. U5 .....6.62
Middletown,O. A10 ....6.62
Niles,O. M21, S3 .....6.62
Youngstown Y1 .....6.62

BLUED STOCK, 29 Gage

Follansbee,W.Va. F4 ...8.65
Ind.Harbor,Ind. I-2 ..8.475
Yorkville,O. W10 ....8.475

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va.W10 7.00
Gary,Ind. U5 .....7.00
Mansfield,O. E6 .....7.00
Middletown,O. A10 ....7.00
Niles,O. M21, S3 .....7.00
Warren,O. R2 .....7.00
Weirton,W.Va. W6 ....7.00

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 .....7.40

Key to Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U.S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke. Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C7 Cleve. Cold Rolling Mills
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.

D2 Detroit Steel Corp.
D3 Dearborn Division Sharon Steel Corp.
D4 Disston Division, H. K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 EasternGas&FuelAssoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins, E., Steel Tube
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md. Fine & Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Division, Merritt-Chapman&Scott
M21 Mallory-Sharon Titanium Corp.
M22 Mill Strip Products Co.

N1 National Standard Co.
N2 National Supply Co.
N3 National Tube Div., U.S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N14 Northwest.SteelRoll.Mill
N15 Northwestern S.&W. Co.
N19 Northeastern Steel Corp.

O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co., Sub. of Barium Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless Steel Div., J&L Steel Corp.

T2 Tenn. Coal & Iron Div., U.S. Steel Corp.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U.S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U.S. Steel Supply Div., U.S. Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Div., H. K. Porter Co. Inc.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet&Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	4.925
Allenport,Pa. P7	4.925
Alton,Ill. L1	5.125
Ashland,Ky.(8) A10	4.925
Atlanta A11	5.125
Bessemer,Ala. T2	4.925
Birmingham C15	4.925
Buffalo(27) R2	4.925
Conshohocken,Pa. A3	4.975
Detroit M1	5.025
Ecorse,Mich. G5	5.025
Fairfield,Ala. T2	4.925
Fontana,Calif. K1	5.775
Gary,Ind. U5	4.925
Houston S5	5.175
Ind.Harbor,Ind. I-2, Y1	4.925
Johnstown,Pa.(25) B2	4.925
KansasCity,Mo. S5	5.175
Lackaw'na,N.Y.(25) B2	4.925
LosAngeles(25) B3	5.675
Minnequa,Colo. C10	6.025
Pittsburg,Calif. C11	5.675
Riverdale,Ill. A1	4.925
SanFrancisco S7	6.35
Seattle(25) B3	5.925
Seattle N14	5.675
Sharon,Pa. S3	4.925
S.SanFrancisco(25) B3	5.675
SparrowsPoint,Md. B2	4.925
Sterling,Ill.(1) N15	4.925
Sterling,Ill. N15	5.025
Torrance,Calif. C11	5.675
Warren,O. R2	4.925
Weirton,W.Va. W6	4.925
Youngstown U5	4.925

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18	8.10
Farrell,Pa. S3	8.10
Gary,Ind. U5	8.10
Houston S5	8.35
Ind.Harbor,Ind. Y1	8.10
KansasCity,Mo. S5	8.35
LosAngeles B3	9.30
Lowellville,O. S3	8.10
Newport,Ky. A2	8.10
Sharon,Pa. S3	8.10
S.Chicago,Ill. W14	8.10
Youngstown U5, Y1	8.10

STRIP, Hot-Rolled High-Strength, Low-Alloy

Bessemer,Ala. T2	7.325
Conshohocken,Pa. A3	7.325
Ecorse,Mich. G5	7.425
Fairfield,Ala. T2	7.325
Farrell,Pa. S3	7.325
Gary,Ind. U5	7.325
Houston S5	7.575
Ind.Harbor,Ind. I-2, Y1	7.325
KansasCity,Mo. S5	7.575
Lackawanna,N.Y. B2	7.325
LosAngeles(25) B3	8.075
Seattle(25) B3	8.325
Sharon,Pa. S3	7.325
S.Chicago,Ill. W14	7.325
S.SanFrancisco(25) B3	8.075
SparrowsPoint,Md. B2	7.325
Warren,O. R2	7.325
Weirton,W.Va. W6	7.325
Youngstown U5, Y1	7.325

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	5.175
Warren,O. R2	5.675

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	7.15
Baltimore T6	7.15
Boston T6	7.70
Buffalo S40	7.15
Cleveland A7, J5	7.15
Conshohocken,Pa. A3	7.20
Dearborn,Mich. D3	7.25
Detroit D2, M1, P20	7.25
Dover,O. G6	7.15
Ecorse,Mich. G5	7.25
Evanston,Ill. M22	7.25
Follansbee,W.Va. F4	7.15
Fontana,Calif. K1	9.00
FranklinPark,Ill. T6	7.25
Ind.Harbor,Ind. Y1	7.15
Indianapolis C8	7.30
LosAngeles C1	9.20
NewBedford,Mass. R10	7.60
NewBritain(10) S15	*7.15*
NewCastle,Pa. B4, E5	7.15
NewHaven,Conn. D2	7.60
NewKensington,Pa. A6	7.15
Pawtucket,R.I. R3	7.80
Pawtucket,R.I. N8	7.70
Philadelphia(45) P24	7.70
Pittsburgh J5	7.15
Riverdale,Ill. A1	7.25
Rome,N.Y.(32) R6	7.15
Sharon,Pa. S3	7.15
Trenton,N.J.(31) R5	8.60
Wallingford,Conn. W2	7.60
Warren,O. R2, T5	7.15
Weirton,W.Va. W6	7.15
Worcester,Mass. A7	7.70
Youngstown J5, Y1	7.15

STRIP, Cold-Rolled Alloy

Boston T6	15.40
Carnegie,Pa. S18	15.05
Cleveland A7	15.25
Dover,O. G6	15.05
Farrell,Pa. S3	15.05
FranklinPark,Ill. T6	15.05
Harrison,N.J. C18	*15.05*
Indianapolis C8	14.70
Lowellville,O. S3	15.05
Pawtucket,R.I. N8	15.40
Riverdale,Ill. A1	15.05
Sharon,Pa.. S3	15.05
Worcester,Mass. A7	15.55
Youngstown J5	14.55

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7	10.45
Dearborn,Mich. D3	10.60
Dover,O. G6	10.45
Ecorse,Mich. G5	10.55
Farrell,Pa. S3	10.50
Ind.Harbor,Ind. Y1	10.65
Sharon,Pa. S3	10.50
Warren,O. R2	10.45
Weirton,W.Va. W6	10.45
Youngstown Y1	10.65

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	7.90

STRIP, C.R. Electrogalvanized

Cleveland A7	7.15*
Dover,O. G6	7.15*
Evanston,Ill. M22	7.25*
Riverdale,Ill. A1	7.25*
Warren,O. B9, T5	7.15*
Worcester,Mass. A7	7.70*
Youngstown J5	6.85*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Sharon,Pa. S3	7.275

TIGHT COOPERAGE HOOP

Atlanta A11	5.65
Riverdale,Ill. A1	5.50
Sharon,Pa. S3	5.35
Youngstown U5	5.35

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol,Conn. W1	...	10.70	12.90	16.10	19.30
Carnegie,Pa. S18	8.95	10.40	12.60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. D3	9.05	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover,O. G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	8.95	10.40	12.60	....	....
Fostoria,O. S1	*10.05*	*11.15*	*13.10*	*18.30*	....
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18	....	....	*12.90*	*16.10*	*19.30*
Indianapolis J5	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
NewBritain,Conn.(10) S15	8.95	10.40	12.60	15.60	18.55
NewCastle,Pa. B4, E5	8.95	10.40	12.60	15.60	....
NewHaven,Conn. D2	9.40	10.70	12.90	15.90	....
NewKensington,Pa. A6	8.95	10.40	12.60	15.60	....
NewYork W3	...	10.70	12.90	16.10	19.30
Pawtucket,R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome,N.Y.(32) R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5	...	10.70	12.90	16.10	19.30
Wallingford,Conn. W2	9.40	10.70	12.90	15.90	18.75
Warren,O. T5	8.65	10.10	12.30	15.30	18.25
Worcester,Mass. A7, T6	9.50	10.70	12.90	15.90	18.85
Youngstown J5	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)			Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol,Conn. W1	...	...	18.10	21.95	26.30
Buffalo W12	...	...	17.10	....	....
Fostoria,O. S1	...	...	*18.30*	*22.15*	....
FranklinPark,Ill. T6	...	...	17.45	21.30	25.65
Harrison,N.J. C18	...	...	*18.10*	*21.95*	*26.30*
NewYork W3	...	...	18.10	21.95	26.30
Palmer,Mass. W12	...	...	17.10	....	....
Trenton,N.J. R5	...	...	18.10	21.95	26.30
Worcester,Mass. A7, T6	...	...	17.10	20.95	25.30
Youngstown J5	...	...	17.45	21.30	25.65

SILICON STEEL

H.R. SHEETS(22 Ga.,cut lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	...	....	11.80	12.90	13.95
Mansfield,O. E6	9.625	11.10	11.80	12.90	13.95
Newport,Ky. A2	9.625	11.10	11.80	12.90	13.95
Niles,O. M21, S3	9.625	11.10	11.80	12.90	....
Vandergrift,Pa. U5	....	11.10	11.80	12.90	13.95
Warren,O. R2	9.625	11.10	11.80	12.90	....
Zanesville,O. A10	....	11.10	11.80	12.90	13.95
Zanesville,O. A10 (SP coils)	....	....	11.55	12.65	13.70

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
Brackenridge,Pa. A4	....	....	12.05	13.15	14.20
GraniteCity,Ill. G4	9.825*	11.05*	11.75*	12.85*	....
IndianaHarbor,Ind. I-2	9.625†	10.85*	11.55*	12.65*	....
Mansfield,O. E6	9.625*	11.35	12.05	13.50	14.20
Vandergrift,Pa. U5	9.625*	11.35	12.05	13.15	14.20
Warren,O. R2	9.625*	11.35	12.05	13.15	14.20
Zanesville,O. A10 (FP coils)	..	11.35	12.05	13.15	14.20

H.R. SHEETS (22 Ga., cut lengths)	Transformer Grades T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	15.00	15.55	16.05	17.10
Vandergrift,Pa. U5	14.75	15.55	16.05	17.10
Zanesville,O. A10	15.00	15.55	16.05	17.10

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	....	17.60	19.20	19.70	20.20	....
Butler,Pa. A10	....	....	19.20	19.70	20.20	....
Vandergrift,Pa. U5	16.60	17.60	19.20	19.70	20.20	15.25**
Warren,O. R2	....	....	....	....	....	15.25‡
Zanesville,O. A10	..	....	....	19.20	19.70	20.20	....

*Semiprocessed. †Fully processed only. ‡Coils, annealed, semiprocessed ½c lower. **Cut lengths, ¾-cent lower.

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$8.75	$9.00	$9.40
Fairfield,Ala. T2	8.85	9.10	9.50
Fairless,Pa. U5	8.85	9.10	9.50
Fontana,Calif. K1	9.50	9.75	10.15
Gary,Ind. U5	8.75	9.00	9.40
GraniteCity,Ill. G4	8.85	9.10	9.50
IndianaHarbor,Ind. I-2, Y1	8.75	9.00	9.40
Irvin,Pa. U5	8.75	9.00	9.40
Niles,O. R2	8.75	9.00	9.40
Pittsburg,Calif. C11	9.50	9.75	10.15
SparrowsPoint,Md. B2	8.85	9.10	9.50
Weirton,W.Va. W6	8.75	9.00	9.40
Yorkville,O. W10	8.75	9.00	9.40

ELECTROTIN (22-27 Gage; Dollars per 100 lb)

Aliquippa,Pa. J5	7.725	7.925	....
Niles,O. R2	7.725	7.925	8.125

TINPLATE, American	1.25 lb	1.50 lb
Aliquippa,Pa.J5	$10.05	$10.30
Fairfield,Ala.T2	10.15	10.40
Fairless,Pa. U5	10.15	10.40
Fontana,Calif.K1	10.80	11.05
Gary,Ind. U5	10.05	10.30
Irvin,Pa. U5	10.05	10.30
Pitts.,Calif. C11	10.80	11.05
Sp.Pt.,Md. B2	10.15	10.40
Weirton,W.Va.W6	10.05	10.30
Yorkville,O. W10	10.05	10.30

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	7.85
Fairfield,Ala. T2	7.95
Fairless,Pa. U5	7.95
Fontana,Calif. K1	8.60
Gary,Ind. U5	7.85
GraniteCity,Ill. G4	7.95
Ind.Harbor,Ind. I-2, Y1	7.85
Irvin,Pa. U5	7.85
Niles,O. R2	7.85
Pittsburg,Calif. C11	8.60
Sparrows Point,Md. B2	7.95
Weirton,W.Va. W6	7.85
Yorkville,O. W10	7.85

HOLLOWARE ENAMELING Black Plate (29 Gage)

Aliquippa,Pa. J5	7.50
Gary,Ind. U5	7.50
GraniteCity,Ill. G4	7.60
Ind.Harbor,Ind. Y1	7.50
Irvin,Pa. U5	7.50
Yorkville,O. W10	7.50

MANUFACTURING TERNES (Special Coated, Base Box)

Gary,Ind. U5	9.70
Irvin,Pa. U5	9.70

ROOFING SHORT TERNES (8 lb Coated, Base Box)

Gary,Ind. U5	11.25

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	7.65
Aliquippa,Pa. J5	7.65
Alton,Ill. L1	7.85
Atlanta A11	7.85
Bartonville,Ill. K4	7.75
Buffalo W12	7.20
Chicago W13	7.65
Cleveland C20	7.20
Cleveland A7	7.65
Crawfordsville,Ind. M8	7.75
Donora,Pa. A7	7.65
Duluth A7	7.65
Fairfield,Ala. T2	7.65
Fostoria,O.(24) S1	7.75
Houston S5	7.90
Jacksonville,Fla. M8	8.00
Johnstown,Pa. B2	7.65
Joliet,Ill. A7	7.65
KansasCity,Mo. S5	7.90
Kokomo,Ind. C16	7.75
LosAngeles B3	8.60
Minnequa,Colo. C10	7.90
Monessen,Pa. P7, P16	7.65
N.Tonawanda,N.Y. B11	7.20
Palmer,Mass. W12	7.50
Pittsburg,Calif. C11	8.60
Portsmouth,O. P12	7.65
Rankin,Pa. A7	7.65
S.Chicago,Ill. R2	7.65
S.SanFrancisco C10	8.60
SparrowsPoint,Md. B2	7.75
Sterling,Ill.(1) N15	7.65
Sterling,Ill. N15	7.75
Struthers,O. Y1	7.65
Waukegan,Ill. A7	7.65
Worcester,Mass. A7	7.95

WIRE, Gal'd ACSR for Cores

Bartonville,Ill. K4	12.65
Buffalo W12	11.90
Cleveland A7	12.65
Donora,Pa. A7	12.65
Duluth A7	12.65
Johnstown,Pa. B2	12.65
Minnequa,Colo. C10	12.775
Monessen,Pa. P16	12.65
Muncie,Ind. I-7	12.85
NewHaven,Conn. A7	12.95
Palmer,Mass. W12	12.20
Pittsburg,Calif. C11	13.45
Portsmouth,O. P12	11.90
Roebling,N.J. R5	12.95
SparrowsPt.,Md. B2	12.75
Struthers,O. Y1	12.65
Trenton,N.J. A7	12.95
Waukegan,Ill. A7	12.65
Worcester,Mass. A7	12.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5	9.30
Alton,Ill. L1	9.50
Buffalo W12	8.70
Cleveland A7	9.30
Donora,Pa. A7	9.30
Duluth A7	9.30
Johnstown,Pa. B2	9.30
KansasCity,Mo. S5	9.55
LosAngeles B3	10.25
Minnequa,Colo. C10	9.50
Monessen,Pa. P7, P16	9.30
NewHaven,Conn. A7	9.60
Palmer,Mass. W12	9.00
Pittsburg,Calif. C11	10.25
Portsmouth,O. P12	9.30
Roebling,N.J. R5	9.60
S.Chicago,Ill. R2	9.30
S.SanFrancisco C10	10.25
SparrowsPt.,Md. B2	9.40
Struthers,O. Y1	9.30
Trenton,N.J. A7	9.60
Waukegan,Ill. A7	9.30
Worcester T6, W12	9.325
Worcester,Mass. A7, J4	9.60

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1	15.80
Bartonville,Ill. K4	15.70
Buffalo W12	14.45
Chicago W13	15.60
Cleveland A7	15.60
Crawfordsville,Ind. M8	15.70
Fostoria,O. S1	15.60
Houston S5	15.85
Jacksonville,Fla. M8	15.95
Johnstown,Pa. B2	15.60
KansasCity,Mo. S5	15.85
Kokomo,Ind. C16	15.60
Minnequa,Colo. C10	15.85
Monessen,Pa. P7	15.60
Muncie,Ind. I-7	15.80
Palmer,Mass. W12	14.75
S.SanFrancisco C10	16.45
Waukegan,Ill. A7	15.60
Worcester,Mass. A7, T6	15.90

ROPE WIRE

Bartonville,Ill. K4	12.75
Buffalo W12	12.00
Fostoria,O. S1	12.75
Johnstown,Pa. B2	12.75
Monessen,Pa. P7	*12.75*
Muncie,Ind. I-7	12.95
Palmer,Mass. W12	12.30
Portsmouth,O. P12	12.75
Roebling,N.J. R5	13.05
SparrowsPt.,Md. B2	12.85
Struthers,O. Y1	12.75
Worcester,Mass. J4	13.05

(A) Plow and Mild Plow; add 0.25c for Improved Plow

WIRE, Tire Bead

Bartonville,Ill. K4	16.55
Monessen,Pa. P16	15.45
Roebling,N.J. R5	17.05

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	11.65
Baltimore T6	11.95
Boston T6	11.95
Buffalo W12	10.75
Chicago W13	11.75
Cleveland A7	11.65
Crawfordsville,Ind. M8	11.65
Dover,O. G6	11.65
Fostoria,O. S1	*11.95*
FranklinPark,Ill. T6	11.75
Kokomo,Ind. C16	11.65
Massillon,O. R8	11.65
Milwaukee C23	*11.85*
Monessen,Pa. P7, P16	11.65
Palmer,Mass. W12	11.05
Pawtucket,R.I. N8	11.95
Philadelphia P24	11.95
Riverdale,Ill. A1	11.75
Rome,N.Y. R6	11.65
Sharon,Pa. S3	11.65
Trenton,N.J. R5	11.95
Warren,O. B9	11.65
Worcester,Mass. A7, T6	11.95

NAILS, Stock	**Col.**
AlabamaCity,Ala. R2	173
Aliquippa,Pa. J5	173
Atlanta A11	175
Bartonville,Ill. K4	175
Chicago W13	173
Cleveland A9	173
Crawfordsville,Ind. M8	175
Donora,Pa. A7	173
Duluth A7	173
Houston,Tex. S5	178
Fairfield,Ala. T2	173
Jacksonville,Fla.(20) M8	184
Joliet,Ill. A7	173
Johnstown,Pa. B2	173
KansasCity,Mo. S5	178
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
Monessen,Pa. P7	173
Pittsburg,Calif. C11	192
Rankin,Pa. A7	173
S.Chicago,Ill. R2	173
SparrowsPt.,Md. B2	175
Sterling,Ill.(7) N15	175
Worcester,Mass. A7	179

(To Wholesalers; per cwt)

Galveston,Tex. D7	$8.95

NAILS, Cut (100 lb keg)
To Dealers (33)

Conshohocken,Pa. A3	$9.80
Wheeling,W.Va. W10	9.80

POLISHED STAPLES	**Col.**
AlabamaCity,Ala. R2	175
Aliquippa,Pa. J5	175
Atlanta A11	177
Bartonville,Ill. K4	177
Crawfordsville,Ind. M8	177
Donora,Pa. A7	175
Duluth A7	175
Fairfield,Ala. T2	175
Jacksonville,Fla.(20) M8	186
Joliet,Ill. A7	175
Johnstown,Pa. B2	175
Kokomo,Ind. C16	*177*
Minnequa,Colo. C10	180
Pittsburg,Calif. C11	194
Rankin,Pa. A7	175
S.Chicago,Ill. R2	175
SparrowsPt.,Md. B2	177
Sterling(7) N15	175
Worcester,Mass. A7	181

TIE WIRE, Automatic Baler (14½ Ga.)(Per 97 lb Net Box)
Coil No. 3150

AlabamaCity,Ala. R2.	$10.26
Atlanta A11	10.36
Bartonville,Ill. K4	10.36
Buffalo W12	9.82
Chicago W13	10.26
Crawfordsville,Ind. M8.	10.36
Donora,Pa. A7	10.26
Duluth A7	10.26
Fairfield,Ala. T2	10.26
Houston S5	10.51
Jacksonville,Fla. M8	10.82
Johnstown,Pa. B2	10.26
Joliet,Ill. A7	10.26
KansasCity,Mo. S5	10.51
Kokomo,Ind. C16	10.36
LosAngeles B3	11.05
Minnequa,Colo. C10	10.51
Pittsburg,Calif. C11	11.04
S.Chicago,Ill. R2	10.26
S.SanFraicisco C10	11.04
SparrowsPt.,Md. B2	10.36
Sterling,Ill.(37) N15	10.36

Coil No. 6500 Stand.

AlabamaCity,Ala. R2.	$10.60
Atlanta A11	10.70
Bartonville,Ill. K4	10.70
Buffalo W12	10.15
Chicago W13	10.60
Crawfordsville,Ind. M8.	10.70
Donora,Pa. A7	10.60
Duluth A7	10.60
Fairfield,Ala. T2	10.60
Houston S5	10.85
Jacksonville,Fla. M8	11.16
Johnstown,Pa. B2	10.60
Joliet,Ill. A7	10.60
KansasCity,Mo. S5	10.85
Kokomo,Ind. C16	10.70
LosAngeles B3	11.40
Minnequa,Colo. C10	10.85
Pittsburg,Calif. C11	11.40
S.Chicago,Ill. R2	10.60
S.SanFrancisco C10	11.40
SparrowsPt.,Md. B2	10.70
Sterling,Ill.(37) N15	10.70

Coil No. 6500 Interim

AlabamaCity,Ala. R2.	$10.65
Atlanta A11	10.75
Bartonville,Ill. K4	10.75
Buffalo W12	10.20
Chicago W13	10.65
Crawfordsville,Ind. M8.	10.75
Donora,Pa. A7	10.65
Duluth A7	10.65
Fairfield,Ala. T2	10.65
Houston S5	10.90
Jacksonville,Fla. M8	11.21
Johnstown,Pa. B2	10.65
Joliet,Ill. A7	10.65
KansasCity,Mo. S5	10.90
Kokomo,Ind. C16	10.75
LosAngeles B3	11.45
Minnequa,Colo. C10	10.90
Pittsburg,Calif. C11	11.45
S.Chicago,Ill. R2	10.65
S.SanFrancisco C10	11.45
SparrowsPt.,Md. B2	10.75
Sterling,Ill.(37) N15	10.75

BALE TIES, Single Loop	**Col.**
AlabamaCity,Ala. R2	212
Atlanta A11	214
Bartonville,Ill. K4	214
Crawfordsville,Ind. M8	214
Donora,Pa. A7	212
Duluth A7	212
Fairfield,Ala. T2	212
Houston S5	217
Jacksonville,Fla. M8	219
Joliet,Ill. A7	212
KansasCity,Mo. S5	217
Kokomo,Ind. C16	214
Minnequa,Colo. C10	217
Pittsburg,Calif. C11	236
S.SanFrancisco C10	236
Sterling,Ill.(7) N15	214
SparrowsPt.,Md. B2	214
Tonawanda,N.Y. B12	169
Williamsport,Pa. S19	175

FENCE POSTS

Birmingham C15	171
ChicagoHts.,Ill. C2, I-2.	172
Duluth A7	172
Franklin,Pa. F5	172
Huntington,W.Va. C15	171
Johnstown,Pa. B2	172
Marion,O. P11	172
Minnequa,Colo. C10	177
Sterling,Ill.(1) N15	172
Tonawanda,N.Y. B12	174

WIRE, Barbed	**Col.**
AlabamaCity,Ala. R2.	193**
Aliquippa,Pa. J5	190§
Atlanta A11	198*
Bartonville,Ill. K4	198
Crawfordsville,Ind. M8	198
Donora,Pa. A7	193†
Duluth A7	193†
Fairfield,Ala. T2	193†
Houston,Tex. S5	198**
Jacksonville,Fla. M8	203
Johnstown,Pa. B2	196§
Joliet,Ill. A7	193†
KansasCity,Mo. S5	198**
Kokomo,Ind. C16	195†
Minnequa,Colo. C10	198**
Monessen,Pa. P7	196*
Pittsburg,Calif. C11	213†
Rankin,Pa. A7	193†
S.Chicago,Ill. R2	193**
S.SanFrancisco C10	213**
SparrowsPoint,Md. B2	198§
Sterling,Ill.(7) N15	198§

WOVEN FENCE, 9-15 Ga.	**Col.**
Ala.City,Ala. R2	187**
Aliq'ppa,Pa.9-14½ga.J5	190§
Atlanta A11	192*
Bartonville,Ill. K4	192
Crawfordsville,Ind. M8	192
Donora,Pa. A7	187†
Duluth A7	187†
Fairfield,Ala. T2	187†
Houston,Tex. S5	192**
Jacksonville,Fla. M8	197
Johnstown,Pa.(43) B2	190§
Joliet,Ill. A7	187†
KansasCity,Mo. S5	192**
Kokomo,Ind. C16	189†
Minnequa,Colo. C10	192**
Pittsburg,Calif. C11	210†
Rankin,Pa. A7	187†
S.Chicago,Ill. R2	187**
Sterling,Ill.(7) N15	192§

WIRE (16 gage)	**An'ld Stone**	**Galv. Stone**
Ala.City,Ala.R2	17.15	18.70**
Aliq'ppa,Pa.	J5.15.70	17.50
Bartonville K4	17.25	19.05
Cleveland A7	17.15	....
Crawf'dsville M8	17.25	19.05
Fostoria,O. S1	*17.65*	*19.20†*
Houston S5	17.40	18.95**
Jacksonville M8	17.50	19.30
Johnstown B2	17.15	18.95§
Kan.City,Mo. S5	17.40	....
Kokomo C16	17.25	18.80†
Minnequa C10	17.40	18.95**
P'lm'r,Mass.W12	16.30	17.85†
Pitts.,Calif. C11	17.50	19.05†
SparrowsPt. B2	17.25	19.05§
Sterling(37) N15	17.25	19.05§
Waukegan A7	17.15	18.70†
Worcester A7	17.45	....

WIRE, Merchant Quality

(6 to 8 gage)	**An'ld**	**Galv.**
Ala.City,Ala. R2.	8.65	9.20**
Aliquippa J5	8.65	9.325§
Atlanta (48) A11	8.75	9.425*
Bartonville(48) K4	8.75	9.425
Buffalo W12	8.20	8.75†
Cleveland A7	8.65	....
Crawfordsville M8	8.75	9.425
Donora,Pa. A7	8.65	9.20†
Duluth A7	8.65	9.20†
Fairfield T2	8.65	9.20†
Houston(48) S5	8.90	9.45**
Jacks'ville,Fla. M8	9.00	9.675
Johnstown B2(48)	8.65	9.325§
Joliet,Ill. A7	8.65	9.20†
Kans.City(48) S5	8.90	9.45**
Kokomo C16	8.75	9.30†
LosAngeles B3	9.60	10.275§
Minnequa C10	8.90	9.45**
Monessen P7(48)	8.65	9.25*
Palmer,Mass. W12	8.50	9.05†
Pitts.,Calif. C11	9.60	10.15†
Rankin,Pa. A7	8.65	9.20†
S.Chicago R2	8.65	9.20**
S.SanFran. C10	9.60	10.15**
Spar'wsPt.B2(48)	8.75	9.425§
Sterling(48) N15	8.90	9.575§
Sterling(1)(48)	8.80	9.475§
Struth'rs,O.(48)Y1	8.65	9.30‡
Worcester,Mass.A7	8.95	9.50†

Based on zinc price of: *13.50c. †5c. §10c. ‡Less than 10c. ††10.50c. **Subject to zinc equalization extras.

FASTENERS

(Base discounts, full container quantity, per cent off list, f.o.b. mill)

BOLTS

Carriage, Machine Bolts
Full Size Body (cut thread)
½ in. and smaller:
6 in. and shorter.... 52.5
Longer than 6 in. .. 43.5
⅝ in. thru 1 in.:
6 in. and shorter.... 43.5
Longer than 6 in. .. 41.5
1⅛ in. and larger:
All lengths 41.5
Undersized Body (rolled thread)
½ in. and smaller:
6 in. and shorter... 52.5
Carriage, Machine, Lag Bolts
Hot Galvanized:
½ in. and smaller:
6 in. and shorter... 32.0
Longer than 6 in. .. 19.0
⅝ in. and larger:
All lengths 16.0
Lag Bolts (all diam.)
6 in. and shorter... 52.5
Longer than 6 in. .. 44.5
Plow and Tap Bolts
½ in. and smaller by 6 in. and shorter 52.0
Larger than ½ in. or longer than 6 in. .. 44.5
Blank Bolts 44.5
Step, Elevator, Tire Bolts 52.0
Stove Bolts, Slotted:
⅛ to ¼-in. incl., 3 in. and shorter.. 54.00
over ½ to ½ in., inclusive 54.00

NUTS

Reg. & Heavy Square Nuts:
All sizes 58.0
Square Nuts, Reg. & Heavy, Hot Galvanized:
All sizes 44.0
Hex Nuts, Reg. & Heavy, Hot Pressed:
¾ in. and smaller.. 61.5
⅞ in. to 1 in., incl. 57.5
1⅛ in. to 1½ in., incl. 62.5
1⅝ in. and larger.. 56.0
Hex Nuts, Reg. & Heavy, Cold Punched:
¾ in. and smaller.. 61.5
⅞ in. to 1½ in., incl. 57.5
1⅝ in. and larger.. 56.0
Hex Nuts, All Types, Hot Galvanized:
¾ in. and smaller.. 48.0
⅞ in. to 1 in., incl.. 44.0
1⅛ in. to 1½ in., incl. 49.0
Hex Nuts, Semifinished, Heavy (Incl. Slotted):
¾ in. and smaller.. 61.5
⅞ in. to 1½ in., incl. 57.5
1⅝ in. and larger.. 56.0
Hex Nuts, Finished (Incl. Slotted and Castiliated):
1 in. and smaller.... 64.0
1⅛ in. to 1½ in., incl. 60.5
1⅝ in. and larger .. 56.0
Semifinished Hex Nuts, Reg. (Incl. Slotted):
⅝ in. and smaller.. 61.5
¾ in. to 1 in., incl. 64.0
1⅛ in. to 1½ in., incl. 60.5
1⅝ in. and larger .. 56.0

CAP AND SETSCREWS
(Base discounts, packages, per cent off list, f.o.b. mill)
Hex Head Capscrews, Coarse or Fine Thread, Bright:
6 in. and shorter:
⅝ in. and smaller.. 44.0
¾, ⅞ and 1 in. diam. 27.0
Longer than 6 in.:
⅝ in. and smaller.. 14.0
¾, ⅞ and 1 in. diam. 0.5
High Carbon, Heat Treated:
6 in. and shorter:
⅝ in. and smaller.. 31.0
¾, ⅞ and 1 in. diam. 9.0
Longer than 6 in.:
⅝ in. and smaller.. +6
¾, ⅞ and 1 in. diam. ..... +24
Flat Head Capscrews:
¾ in. and smaller.. +65.0
Setscrews, Square Head, Cup Point, Coarse Thread:
Through 1 in. diam.:
6 in. and shorter... 11
Longer than 6 in... +10

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.
Structural ½ in., larger 12.25
7/8 in. under list less 19%.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	25.98	23.54
1¼	13	....	30.78	23.36
1½	13	29.03	34.01	25.83
1¾	13	34.29	40.18	30.51
2	13	38.44	45.05	34.20
2¼	13	43.29	50.75	38.52
2¼	12	46.99	55.06	41.81
2½	12	51.76	60.65	46.05
2¾	12	56.04	65.67	49.88
3	12	59.76	70.03	53.19

RAILWAY MATERIALS

	Standard No. 1	Standard No. 2	Tee Rails All No. 2	Tee Rails 60 lb Under
RAILS				
Bessemer,Pa. U5	5.525	5.425	....	6.50
Ensley,Ala. T2	5.525	5.425	....	6.50
Fairfield,Ala. T2	....	....	....	6.50
Huntington,W.Va. C15	....	....	....	6.50
Gary,Ind. U5	5.525	5.425	....	...
IndianaHarbor,Ind. I-2	5.525	5.425	5.475	...
Johnstown,Pa. B2	....	....	...(16)	6.50
Lackawanna,N.Y. B2	5.525	5.425	....	6.50
Minnequa,Colo. C10	5.525	5.425	....	7.00
Steelton,Pa. B2	5.525	5.425	....	...
Williamsport,Pa. S19	....	....	....	6.50

TIE PLATES

Fairfield,Ala. T2	6.60
Gary,Ind. U5	6.60
Ind.Harbor,Ind. I-2	6.60
Lackawanna,N.Y. B2	6.60
Minnequa,Colo. C10	6.60
Seattle B3	6.75
Steelton,Pa. B2	6.60
Torrance,Calif. C11	6.75

JOINT BARS

Bessemer,Pa. U5	6.975
Fairfield,Ala. T2	6.975
Ind.Harbor,Ind. I-2	6.975
Joliet,Ill. U5	6.975
Lackawanna,N.Y. B2	6.975
Minnequa,Colo. C10	6.975
Steelton,Pa. B2	6.975

AXLES

Ind.Harbor,Ind. S13	8.775
Johnstown,Pa. B2	8.775

TRACK BOLTS, Untreated

Cleveland R2	14.75
KansasCity,Mo. S5	14.75
Lebanon,Pa. B2	14.75
Minnequa,Colo. C10	14.75
Pittsburgh P14	14.75
Seattle B3	15.25

SCREW SPIKES

Lebanon,Pa. B2	14.50

STANDARD TRACK SPIKES

Fairfield,Ala. T2	9.75
Ind.Harbor,Ind. I-2, Y1	9.75
KansasCity,Mo. S5	9.75
Lebanon,Pa. B2	9.75
Minnequa,Colo. C10	9.75
Pittsburgh J5	9.75
Seattle B3	10.25
S.Chicago,Ill. R2	9.75
Struthers,O. Y1	9.75
Youngstown R2	9.75

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Chicago or Birm. base.
(7) Chicago base 2 cols. lower.
(8) 13 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) Plus 1c per 100 lb.
(21) New Haven, Conn. base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.15c, finer than 15 Ga.
(25) Bar mill bands.
(26) Delivered in mill zone, 6.045c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.50c.
(31) Widths over ⅝-in.; 7.60c, for widths ⅝-in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.685c.
(43) 9-14½ Ga.
(44) To fabricators.
(45) 0.022 in. and lighter, over 0.022", 8.20c.
(46) Special quality.
(48) 6-7 Ga.
(49) 3½-in. and smaller rounds; 8.65c, over 3½-in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+9.25	+24.5	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25
Ambridge, Pa. N2	+9.25	....	+2.75	....	+0.25	....	1.25	....	1.25	....	1	....	3.5	....
Lorain, O. N3	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25
Youngstown Y1	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled Carload discounts from list, %

Youngstown R2	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25

BUTTWELD STANDARD PIPE, Threaded and Coupled Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Alton, Ill. L1	....	....	....	....	....	....	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Benwood, W. Va. W10	4.5	+22	+7.5	+31	+18	+39.5	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Butler, Pa. F6	5.5	+21	+6.5	+30	+17	+38.5	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Fairless, Pa. N3	....	....	....	....	....	....	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Fontana, Calif. K1	....	....	....	....	....	....	+8.25	+23.5	+5.25	+19.5	+1.75	+15	0.75	+14.25
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	4.25	+11	7.25	+7	10.75	+2.5	13.25	+3.25
Lorain, O. N3	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Sharon, Pa. S4	5.5	+21	+6.5	+30	+17	+38.5	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Sparrows Pt., Md. B2	3.5	+23	8.5	+32	+19	+40.5	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Wheatland, Pa. W9	5.5	+21	+6	+30	+17	+38.5	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Youngstown R2, Y1	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75

Size—Inches	1⅛		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Alton, Ill. L1	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	....	....	....	....
Benwood, W. Va. W10	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Etna, Pa. N2	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Fairless, Pa. N3	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	4.25	+12.5	4.25	+12.5
Fontana, Calif. K1	1.25	+13.25	1.75	+12.75	3.25	+13	3.25	+13	+7.25	+24	+7.25	+24
Indiana Harbor, Ind. Y1	13.75	+0.75	14.25	+0.25	15.75	+0.5	15.25	+0.5	5.25	+11.5	5.25	+11.5
Lorain, O. N3	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Sharon, Pa. M6	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Sparrows Pt., Md. B2	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	4.25	+12.5	4.25	+12.5
Wheatland, Pa. W9	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Youngstown R2, Y1	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5

*Galvanized pipe discounts based on current price of zinc (10.00c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	—Rerolling— Ingot	Slabs	Forging Billets	H.R. Strip	Wire Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	22.00	27.00	....	36.00	....	42.00	44.25	48.50	45.00
202	23.75	30.25	36.50	39.00	40.75	43.00	45.00	49.25	49.25
301	23.25	28.00	37.25	37.25	42.00	44.25	46.25	51.25	47.50
302	25.25	31.50	38.00	40.50	42.75	45.00	47.25	52.00	52.00
302B	25.50	32.75	40.75	45.75	45.00	47.25	49.50	57.00	57.00
303	....	32.00	41.00	....	45.75	48.00	50.00	56.75	56.75
304	27.00	33.25	40.50	44.25	45.50	47.75	50.75	55.50	55.50
304L	....	....	48.25	51.50	53.25	55.50	58.50	63.25	63.25
305	28.50	36.75	42.50	47.50	45.50	47.75	51.25	58.75	58.75
308	30.75	38.25	47.25	50.25	52.75	55.75	60.25	63.00	63.00
309	39.75	49.50	57.75	64.50	63.75	67.00	71.00	80.50	80.50
310	49.75	61.50	78.00	84.25	86.50	91.00	92.75	96.75	96.75
314	....	....	....	....	86.50	....	92.75	....	104.50
316	39.75	49.50	62.25	69.25	69.50	73.00	76.75	81.50	81.50
316L	....	....	70.00	76.50	77.25	80.75	84.50	89.25	89.25
317	48.00	60.00	76.75	88.25	86.25	90.75	93.50	101.00	101.00
321	32.25	40.00	47.00	53.50	52.50	55.50	59.75	65.50	65.50
18-8 CbTa	37.00	46.50	55.75	63.50	61.50	64.75	69.75	79.25	79.25
403	....	....	32.00	....	36.00	37.75	40.25	48.25	48.25
405	19.50	25.50	29.75	36.00	33.75	35.25	37.50	46.75	46.75
410	16.75	21.50	28.25	31.00	32.25	33.75	35.00	40.25	40.25
416	....	....	28.75	....	32.75	34.25	36.25	48.25	48.25
420	....	33.50	34.25	41.75	39.25	41.25	45.25	62.00	62.00
430	17.00	21.75	28.75	32.00	32.75	34.25	36.00	40.75	40.75
430F	....	....	29.50	....	33.25	34.75	36.75	51.75	51.75
431	....	28.75	37.75	....	42.00	44.25	46.00	56.00	56.00
446	....	....	39.25	59.00	44.25	46.50	47.75	70.00	70.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Div., H. K. Porter Co. Inc.; Alloy Tube Div., Carpenter Steel Co.; American Steel & Wire Div., U.S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Charter Wire Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Elwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Jones & Laughlin Steel Corp.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McInnes Steel Co.; McLouth Steel Corp.; Metal Forming Corp.; National-Standard Co.; National Tube Div., U.S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Stainless Steel Div., Jones & Laughlin Steel Corp.; Superior Steel Corp.; Superior Tube Co.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

Clad Steel

Stainless	Plates—Carbon Base 5%	10%	15%	20%	Sheets Carbon Base 20%
302	....	....	....	....	37.50
304	34.70	37.95	42.25	46.70	40.00
304L	36.90	40.55	45.10	49.85	....
316	40.35	44.40	49.50	54.50	58.75
316L	45.05	49.35	54.70	60.10	....
316 Cb	47.30	53.80	61.45	69.10	....
321	36.60	40.05	44.60	49.30	47.25
330	....	....	....	105.50	108.00
347	38.25	42.40	47.55	52.80	57.00
405	28.60	29.85	33.35	36.85	....
410	28.15	29.55	33.10	36.70	....
430	28.30	29.80	33.55	37.25	....
Inconel	48.90	59.55	70.15	80.85	....
Nickel	41.65	51.95	62.30	72.70	....
Nickel, Low Carbon	41.95	52.60	63.30	74.15	....
Monel	43.35	53.55	63.80	74.05	....
Copper*	....	....	....	....	46.00

	Strip, Carbon Base —Cold Rolled— 10%	Both Sides
Copper*	33.00	39.85

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.290	Cr Hot Work	0.45-0.495
Extra Carbon	0.345	W-Cr Hot Work	0.43-0.475
Special Carbon	0.41-0.45	V-Cr Hot Work	0.460
Oil Hardening	0.450	Hi-Carbon-Cr	0.830

Grade by Analysis (%) W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	....	4.170
18.25	4.25	1	4.75	....	2.385
18	4	2	9	....	2.755
18	4	2	....	....	1.845
18	4	1	....	....	1.680
9	3.5	..	....	....	1.275
13.5	4	3	....	....	1.945
13.75	3.75	2	5	....	2.325
6.4	4.5	1.9	....	5	1.185
6	4	3	....	6	1.430
1.5	4	1	....	8.5	1.040

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Birmingham District				
AlabamaCity,Ala. R2	62.00	62.50	....	....
Birmingham R2	62.00	62.50‡	....	....
Birmingham U6	....	62.50‡	66.50	....
Woodward,Ala. W15	62.00**	62.50‡	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N.Tonawanda,N.Y. T9	....	66.50	67.00	67.50
Tonawanda,N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	....
Rochester,N.Y., deld.	69.02	69.52	70.02	....
Syracuse,N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S.Chicago,Ill. R2	66.00	....	66.50	....
S.Chicago,Ill. W14	66.00	....	66.50	67.00
Milwaukee, deld.	68.46	68.96	68.96	69.46
Muskegon,Mich., deld.	....	80.33	80.33	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron,O., deld.	69.12	69.62	69.62	70.12
Mid-Atlantic District				
Birdsboro,Pa. B10	68.00	68.50	69.00	69.50
Chester,Pa. P4	66.50	67.00	67.50	....
Swedeland,Pa. A3	68.00	68.50	69.00	69.50
New York, deld.	....	74.70	75.20	....
Newark,N.J., deld.	72.02	72.52	73.02	73.52
Philadelphia, deld.	69.88	70.38	70.88	71.38
Troy,N.Y. R2	68.00	68.50	69.00	69.50
Pittsburgh District				
NevilleIsland, Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	67.95	67.95	68.48
McKeesRocks,Pa., deld.	....	67.60	67.60	68.13
Lawrenceville, Homestead, Wilmerding,Monaca,Pa., deld.	....	68.26	68.26	68.79
Verona,Trafford,Pa., deld.	68.29	68.82	68.82	69.35
Brackenridge,Pa., deld.	68.60	69.10	69.10	69.63
Midland,Pa. C18	66.00	....	....	....
Youngstown District				
Hubbard, O. Y1	....	....	66.50	....
Sharpsville,Pa. S6	66.00	....	66.50	67.00
Youngstown Y1	....	....	66.50	67.00
Mansfield,O., deld.	70.90	....	71.40	71.90
Duluth I-3	66.00	66.50	66.50	67.00
Erie,Pa. I-3	66.00	66.50	66.50	67.00
Everett, Mass. E1	66.50	67.00	67.50	....
Fontana,Calif. K1	74.00	74.50	....	....
Geneva,Utah C11	66.00	66.50	....	....
GraniteCity,Ill. G4	67.90	68.40	68.90	....
Ironton,Utah C11	66.00	66.50	....	....
Minnequa,Colo. C10	*68.00*	*68.50*	*69.00*	....
Rockwood,Tenn. T3	....	62.50‡	66.50	....
Toledo,O. I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.54	73.04	....	....

**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
‡Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.
Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.
Nickel: Under 0.50% no extra; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% add $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson,O. I-3, J1	77.25
Buffalo H1	78.50

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity,Ky. P15	$99.00
NiagaraFalls,N.Y. P15	99.00
Keokuk,Iowa Open-hearth & Fdry, $9 freight allowed K2	103.50
Keokuk,Iowa O.H. & Fdry, 12½ lb piglets, 16% Si, max fr'gt allowed up to $9, K2	106.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$78.50
Troy,N.Y. R2 (Phos. 0.035% max)	74.00
Philadelphia, deld.	81.76
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
NevilleIsland,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	71.00

Warehouse Steel Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Houston, Seattle no charge.

	SHEETS				STRIP	BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Gal. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††[5]		Carbon	Floor
Atlanta	8.59§	9.86§	10.13§	....	8.64	9.01	10.68	....	9.05	8.97	10.90
Baltimore	8.28	8.98	9.76	....	8.76	9.06	9.13[3]	15.18	9.19	8.66	10.14
Birmingham	7.80	9.00	9.52	....	7.82	8.07	10.12	....	8.20	8.16	10.31
Boston	9.31	10.40	11.41	....	9.35	9.68	....	15.24	9.59	9.65	11.13
Buffalo	8.25	9.45	11.07	....	8.50	8.80	....	15.00	8.90	8.90	10.45
Chattanooga	7.99	9.24	9.10	....	8.00	8.24	10.04	....	8.44	8.40	10.26
Chicago	8.20	9.45	10.00	....	8.23	8.60	8.80	14.65	8.64	8.56	9.88
Cincinnati	8.34	9.48	10.05	....	8.54	8.92	9.31	14.96	9.18	8.93	10.21
Cleveland	8.18	9.45	9.95	....	8.33	8.69	....	14.74	9.01	8.79	10.11
Denver	9.38	11.75	....	....	9.41	9.78	11.10	....	9.82	9.74	11.06
Detroit	8.43	9.70	10.35	....	8.58	8.90	9.15	14.91	9.18	8.91	10.13
Erie, Pa.	8.20	9.45	9.95[10]	....	8.50	8.75	9.05[10]	....	9.00	8.85	10.10
Houston	8.80	9.75	10.99	....	7.75	8.05	10.65	15.00	8.00	8.80	10.30
Jackson, Miss.	8.09	9.34	9.79	....	8.16	8.41	10.23	....	8.54	8.50	10.34
Los Angeles	9.50	10.75	11.65	....	9.55	9.55	12.75	16.00	9.60	9.55	11.70
Milwaukee	8.33	9.58	10.13	....	8.36	8.73	9.03	14.78	8.85	8.69	10.01
Moline, Ill.	8.13	9.35	10.05	....	8.17	8.42	8.70	....	8.55	8.51	...
New York	8.87	10.13	10.56	....	9.31	9.57	....	15.09	9.35	9.43	10.71
Norfolk, Va.	8.05	....	...	...	8.55	8.60	10.80	....	8.95	8.45	9.95
Philadelphia	8.00	8.90	10.24	51.94	8.67	8.65	9.76	15.01	8.50	8.77	9.77**
Pittsburgh	8.18	9.45	10.35	50.00	8.33	8.60	9.05	14.65	8.64	8.56	9.88
Portland, Oreg.	9.50	11.20	11.55	57.20	11.35‡‡	9.65	14.50	15.95	9.65	9.30	12.50
Richmond, Va.	8.00	....	10.14	....	8.55	8.40	10.00	....	8.95	8.40	9.90
St. Louis	8.54	9.79	10.36	....	8.59	8.97	9.41	15.01	9.10	8.93	10.25
St. Paul	8.39	9.59	10.26	..	8.43	8.68	9.21	....	8.94	8.90	10.10
San Francisco	9.35	10.75	10.85	54.85	9.45	9.70	13.00	16.10	9.50	9.60	12.00
Seattle	9.95	11.15	12.00	57.20	10.00	10.10	14.05	16.35	9.80	9.70	12.10
Spokane, Wash.	9.95	11.15	12.00	....	10.00	10.10	14.05	17.10	9.80	9.70	12.10
Washington	8.48	9.58	....	....	9.06	9.15	9.73	....	9.35	8.86	10.36

*Prices do not include gage extras; †prices include gage and coating extras, except in Birmingham (coating extra excluded); ‡includes 35-cent bar quality extras; §42 in. and under; **⅛-in. and heavier; ††as annealed; ‡‡over 4 in.; §§over 3 in.

Base quantities, 2000 to 4999 lb except as noted; cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2000 to 9999 lb, and in Los Angeles, 6000 lb and over; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, Portland, Oreg. 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Portland, Oreg., 1000 to 9999 lb; [3]—400 to 9999 lb; [5]—1000 to 1999 lb; [8]—2000 to 3999 lb; [10]—2000 lb and over.

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., $135; Salina, Pa., $140; Niles, O., $138; Cutler, Utah, $165.

Super-Duty: Ironton, O., Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Pa., New Savage, Md., St. Louis, $175; Stevens Pottery, Ga., $185; Cutler, Utah, $233.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, O., Hawstone, Pa., $150; Warren, Niles, Windham, O., Hays, Latrobe, Morrisville, Pa., $155; E. Chicago, Ind., Joliet, Rockdale, Ill., $160; Lehigh, Utah, $175; Los Angeles, $180.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, O., Leslie, Md., Athens, Tex., $157; Morrisville, Hays, Latrobe, Pa., $160; E. Chicago, Ind., $167; Curtner, Calif., $182.

Semisilica Brick (per 1000)

Clearfield, Pa., $140; Philadelphia, $137; Woodbridge, N.J., $135.

Ladle Brick (per 1000)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, O., $96.75; Clearfield, Pa., Portsmouth, O., $102.

High-Alumina Brick (per 1000)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $235; Danville, Ill., $238; Philadelphia, Clearfield, Pa., $230; Orviston, Pa., $245.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $295; Danville, Ill., $298; Philadelphia, Clearfield, Orviston, Pa., $305.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $335; Danville, Ill., $338; Philadelphia, Clearfield, Orviston, Pa., $345.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $188.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo, O., $16; Thornton, McCook, Ill., $16.35; Dolly Siding, Bonne Terre, Mo., $15.

Magnesite (per net ton)

Domestic, dead-burned, bulk ½-in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅜-in. grains with fines: Baltimore, $73.

Fluorspar

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-$41; 70%, $36-$40; 60%, $33-$36.50. Imported, net tons, f.o.b. cars point of entry duty paid, metallurgical grade: European, $33-$34; Mexican, all-rail, duty paid, $25.25-$25.75; barge, Brownsville, Tex., $27.25-$27.75.

Ores

Lake Superior Iron Ore

(Prices effective for the 1957 shipping season, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old range bessemer	11.85
Old range nonbessemer	11.70
Open-hearth lump	12.70
High phos.	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 30, 1957, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, foundry and basic 62-64% concentrates	25.00-27.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	27.00-27.50
N. African hematite (spot)	nom.
Brazilian iron ore, 68-69%	32.00-33.00

Tungsten Ore

Net ton unit, before duty

Foreign wolframite, good commercial quality	20.00-23.00
Domestic, concentrates mine	55.00

Manganese Ore

Mn 46-48%, Indian (export tax included), $1.60-1.70 per long ton unit, c.i.f. U.S. ports, duty for buyer's account: other than Indian, $1.45-1.50; contracts by negotiation.

Chrome Ore

Gross ton f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian

48% 3:1	$55.00-58.00
48% 2.8:1	52.00-55.00
48% no ratio	46.00-48.00

South African Transvaal

48% no ratio	$40.00-41.00
44% no ratio	30.00-31.00

Turkish

48% 3:1	$59.00-62.00

Domestic

Rail nearest seller

18% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb of Mo content, mines, unpacked	$1.18

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard

55-60%	$3.10-3.60
60-65%	3.60-3.80

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, Swedish: Deld. east of Mississippi river, ocean bags 23,000 lb and over.. F.o.b. Riverton or Camden, N.J., west of Mississippi river..	10.50 / 9.50
Sponge Iron, domestic, 98 + % Fe: Deld. east of Mississippi river, 23,000 lb and over F.o.b. Riverton, N.J., west of Mississippi river	10.50 / 9.50
Sponge Iron, Canadian: F.o.b. shipping point	9.50
Electrolytic Iron: Melting stock, 99.9% Fe, irregular fragments of ⅛ in. x 1.3 in.	28.00
Annealed, 99.5% Fe..	36.50
Unannealed (99+ % Fe)	36.00
Unannealed (99+ % Fe) (minus 325 mesh)	59.00
Powder Flakes (minus 16, plus 100 mesh)..	29.00
Carbonyl Iron: 98.1-99.9%, 3 to 20 microns, depending on grade, 93.00-290.00 in standard 200-lb containers; all minus 200 mesh.	

Aluminum: Atomized, 500 lb drum, fr'ght allowed Carlots	38.20
Ton lots	40.20
Antimony, 500 lb lots.	32.00*
Brass, 5000-lb lots	32.60-39.40†
Bronze, 5000-lb lots	50.20-54.70†
Copper: Electrolytic	14.25*
Reduced	14.25*
Lead	7.50*
Manganese: Minus 35 mesh	64.00
Minus 100 mesh	70.00
Minus 200 mesh	75.00
Nickel, unannealed	$1.15
Nickel-Silver, 5000-lb lots	50.80-55.40†
Phosphor-Copper, 5000-lb lots	62.00
Copper (atomized) 5000-lb lots	44.50-52.00‡
Silicon	47.50
Solder	7.00*
Stainless Steel, 304	$1.08
Stainless Steel, 316	$1.44
Tin	14.50*
Zinc, 5000-lb lots	18.00-31.20‡
Tungsten: Melting grade, 99% 60 to 2000 mesh: 1000 lb and over	3.75
Less than 1000 lb	3.90
Chromium, electrolytic 99.8% Cr min metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

Inches Diam.	Inches Length	Per 100 lb
2	24	$57.75
2½	30	37.25
3	40	35.25
4	40	33.25
5½	40	33.00
6	60	30.00
7	60	26.75
8, 9, 10	60	26.50
12	72	25.50
14	60	25.50
16	72	24.50
17	60	25.50
18	72	24.50
20	72	24.00
24	84	24.75

CARBON

8	60	13.30
10	60	13.00
12	60	12.95
14	60	12.85
14	72	11.95
17	60	11.85
17	72	11.40
20	84	11.40
20	90	11.00
24	72, 84	11.25
24	96	10.95
30	84	11.05
40, 35	110	10.70
40	100	10.70

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, furnace	$14.75-15.75
Connellsville, foundry	18.00-18.50

Oven Foundry Coke

Birmingham, ovens	$28.85
Cincinnati, deld.	33.78
Buffalo, ovens	30.50
Camden, N. J., ovens	29.50
Detroit, ovens	30.50
Pontiac, deld.	32.25
Saginaw, deld.	33.83
Erie, Pa., ovens	30.50
Everett, Mass., ovens New England, deld.	31.55*
Indianapolis, ovens	29.75
Ironton, O., ovens	29.00
Cincinnati, deld	31.84
Kearny, N.J., ovens	29.75
Milwaukee, ovens	30.50
Painesville, O., ovens	30.50
Cleveland, deld.	32.69
Philadelphia, ovens	29.50
St. Louis, ovens	31.50
Neville Island (Pittsburgh), Pa., ovens.	29.25
St. Paul, ovens	29.75
Chicago, deld.	33.24
Swedeland, Pa., ovens	29.50
Terre Haute, Ind., ovens	29.75

*Or within $4.80 freight zone from works.

Imported Steel

(Base per 100 lb, landed, duty paid, based on current ocean rates. Any increase in these rates is for buyer's account. Source of shipment: Western continental European countries)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	$6.58	$6.53	$6.53	$6.76
Bar Size Angles	6.62	6.57	6.57	6.75
Structural Angles	6.62	6.57	6.57	6.75
I-Beams	6.87	6.82	6.82	7.00
Channels	6.87	6.82	6.82	7.00
Plates (basic bessemer)	8.50	8.45	8.45	8.75
Sheets, H.R.	8.50	8.45	8.45	8.75
Sheets, C.R. (drawing quality)	9.00	8.95	8.95	9.25
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	26.79	26.67	26.67	27.36
Barbed Wire (†)	6.95	6.95	6.95	7.40
Merchant Bars	6.87	6.82	6.82	7.22
Hot-Rolled Bands	7.20	7.15	7.15	7.55
Wire Rods, Thomas Commercial No. 5	6.73	6.73	6.73	7.13
Wire Rods, O.H. Cold Heading Quality No. 5	7.07	7.07	7.07	7.47
Bright Common Wire Nails (§)	8.38	8.38	8.38	8.58

†Per 82-lb. net, reel. §Per 100-lb kegs, 20d nails and heavier.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzene	36.00
Toluene, one deg.	32.00-34.00
Industrial xylene	32.00-35.00

Per ton, bulk, ovens

Ammonium sulfate	$32.00

Cents per pound, producing point

Phenol: Grade 1, 15.00; Grade 2-3, 14.50; Grade 4, 16.50; Grade 5, 15.25.

Ferroalloys

MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton, Palmerton, Pa. 21-23% Mn, $105; 19-21% Mn, 1-3% Si, $102.50; 16-19% Mn, $100.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx). Base price per net ton; $255, Johnstown, Duquesne, Sheridan, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74% respectively.

(Mn 79-81%). Lump $263 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

High-Grade Low-Carbon Ferromanganese: (Mn 85-90%). Carload, lump, bulk, max 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.03% C, 3.5c for max 0.50% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn, packed, carload 26.8c, ton lot 28.4c, less ton 29.6c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max). Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lot 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carload, 34c; 2000 lb to min carload, 36c; 500 lb to 1999 lb, 38c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk 1.50% C grade, 18-20% Si, 12.8c per lb of alloy. Packed, c.l. 14c, ton 14.45c, less ton 15.45c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $200 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $225 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l. lump, bulk, 27.75c per lb of contained Cr; c.l. packed 29.3c, ton lot 31.05c; less ton 32.45c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-71%). Contract, carload, lump, bulk, C 0.025% max (Simplex) 34.75c per lb contained Cr, 0.02% max 41.5c, 0.03% max 41c, 0.06% max 39.5c, 0.1% max 39c, 0.15% max 38.75c, 0.2% max 38.5c, 0.5% max 38.25c, 1.0% max 37.5c, 1.5% max 37.35c, 2.0% max 37.25c. Ton lot, add 3.4c, less ton add 5.1c. Carload packed add 1.75c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%, Si 7-10%). Contract, c.l., 2 in. x D, bulk 29.05c per lb of contained Cr. Packed, c.l. 30.65c, ton 32.45c, less ton 33.95c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, 8M x D, 20.85c, per lb of alloy, ton lot 22.10c; less ton lots 23.3c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome-Silicon: (Cr 39-41%, Si 42-49%, C 0.05% max). Contract, carload, lump, 4" x down and 2" x down, bulk, 41.35c per lb of contained Cr; 1" x down, bulk, 42.35c. Delivered.

Chromium Metal, Electrolytic: Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed 2" x D plate (about ⅛" thick) $1.29 per lb, ton lot $1.31. less ton lot $1.33. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade:** (V 50-55%, or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1 $1.05 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lot, packed, $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si. Packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 13c per lb of contained Si. Packed c.l. 15.5c, ton lot 16.95c, less ton 18.6c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 15.25c per lb contained silicon. Packed, c.l. 17.25c, ton lot 19.05c; less ton 20.4c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 16.4c per lb of contained Si. Packed, c.l. 18.30c, ton lot 19.95c, less ton 21.2c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 19.5c per lb of contained Si. Packed, c.l. 21.15c, ton lot 22.55c, less ton 23.6c. Delivered. Spot, add 0.25c.

Silicon Metal: (98% min Si, 0.75% max Fe, 0.07% max Ca). C.l. lump, bulk, 20.00c per lb of Si. Packed, c.l. 21.65c, ton lot 22.95c, less ton 23.95c. Add 0.5c for max 0.03% Ca grade. Deduct 0.5c for max 1% Fe grade analyzing min 99.75% Si; 0.75c for max 1.25% Fe grades analyzing min 96.75% Si. Spot, add 0.25c.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 10.65c per lb of alloy; ton lot, packed, 11.8c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 27.25c per lb of alloy, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Bortam: (B 1.5-1.9%). Ton lot, 45c per lb; less than ton lot, 50c per lb.

Carbortam: (1 to 2%). Contract, lump, carload 9.50c per lb f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Contract, carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx 3⅜ lb each and containing 2 lb of Cr). Contract, carload, bulk 19c per lb of briquet, carload packed in box pallets 19.2c, in bags 20.1c; 3000 lb to c.l. in box pallets 20.4c; 2000 lb to c.l. in bags, 21.3; less than 2000 lb in bags 22.2c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx 3 lb and containing 2 lb of Mn). Contract, carload, bulk 14.8c per lb of briquet; c.l., packed, pallets 15c, bags 16c; 3000 lb to c.l., pallets 16.2c; 2000 lb to c.l. bags, 17.2c; less ton 18.1c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx 3½ lb and containing 2 lb of Mn and approx ½ lb of Si). Contract, c.l. bulk 15.1c per lb of briquet; c.l. packed, pallets, 15.3c; bags 16.3c, 3000 lb to c.l., pallets, 16.5c; 2000 lb to c.l., bags 17.5c; less ton 18.4c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx 5 lb and containing 2 lb of Si). Contract, carload, bulk 7.7c per lb of briquet; packed, pallets, 7.9c; bags 8.9c; 3000 lb to c.l., pallets 9.5c; 2000 lb to c.l. bags 10.5c; less ton 11.4c. Delivered. Spot, add 0.25c. (Small size—weighing approx 2½ lb and containing 1 lb of Si). Carload, bulk 7.85c. Packed, pallets 8.05c; bags 9.05c; 3000 lb to c.l. pallets 9.65c; 2000 lb to c.l. bags 10.65c; less ton 11.55c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each). $1.41 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 5000 lb W or more $2.95 per lb of contained W; 2000 lb W to 5000 lb W, $3.05; less than 2000 lb W, $3.17. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.4% max). Contract, ton lot 2" x D, $4.90 per lb of contained Cb. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx, Ta 20% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lot 2" x D, $4.25 per lb of contained Cb plus Ta, delivered; less ton lot $4.30.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5.7%, Fe 20% approx). Contract, c.l. packed ½-in. x 12 M 19c per lb of alloy, ton lot 20.15c, less ton 21.4c. Delivered. Spot, add 0.25c.

Graphidox No. 5: (Si 48-52%, Ca 5.7%, Ti 9-11%). C.l. packed, 19c per lb of alloy, ton lot 20.15c; less ton lot 21.4c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

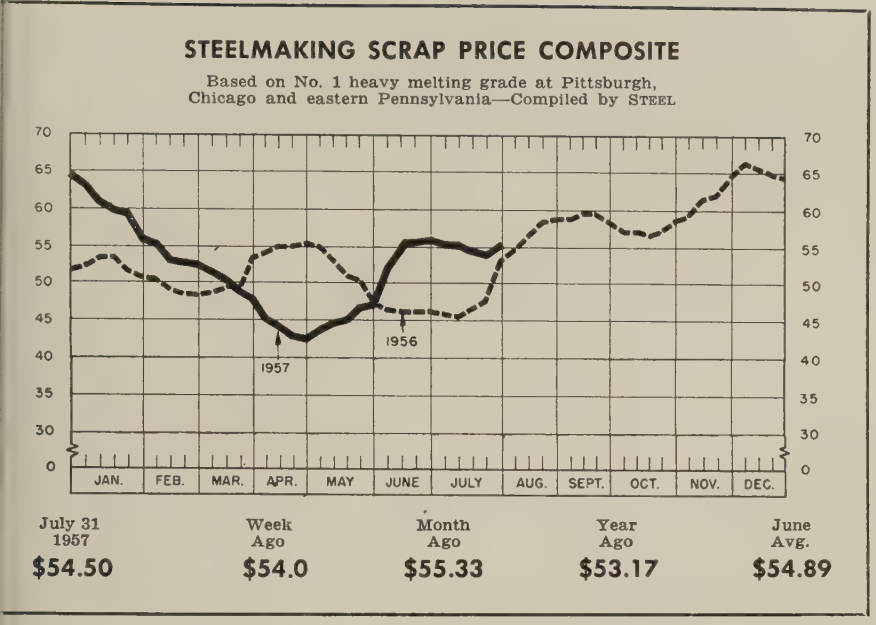
V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.1c per lb of alloy; ton lot 19.55c; less ton lot 20.8c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal Fe). Lump, carload, bulk 18.50c. Packed c.l. 19.50c, 2000 lb to c.l. 20.50c, less than 2000 lb 21c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carload, f.o.b. sellers' works. Mt. Pleasant, Siglo, Tenn., $110 per gross ton.

Ferromolybdenum: (55-75%). Per lb of contained Mo, in 200-lb container, f.o.b. Langeloth and Washington, Pa., $1.68 in all sizes except powdered which is $1.74.

Technical Molybdic-Oxide: Per lb of contained Mo, in cans, $1.39; in bags, $1.38, f.o.b. Langeloth and Washington, Pa.



Scrap Prices Making a Turnabout

STEEL's composite on the prime steelmaking grade rises 50 cents (to $54.50) after declining steadily since the end of June. Market undertone firm, though buying lags

Scrap Prices, Page 158

Pittsburgh—Despite the absence of major mill purchases of the leading grades, there's a feeling of strength in the scrap market. This rises from expectation of increases in mill operations in late third quarter, a continued shortage of good quality scrap and strength in the quotations for No. 1 factory bundles. Industrial lists which closed late in July showed an advance of $2 in prices on factory bundles. The strength generally gave a firmer tone to the market. Cut structurals and heavy turnings edged upwards $1.

Chicago—Growing strength in scrap continues to push prices up despite negligible consumer purchases. All leading grades are carrying higher quotations in the market than were being quoted a week ago. Brokers have upped their offers to dealers. Dealers show no interest in contracting for large tonnages in the belief that the price trend will continue up.

While less industry scrap was generated in July because of vacation closings, that is not the influence pushing the market higher. The chief prod is the universal optimism for steelmaking operations in the fourth quarter.

The cast iron grades are stronger, with some foundries attempting unsuccessfully to buy tonnage now for delivery at a later date.

Philadelphia — Domestic scrap buying is light, with prices moving within a narrow range. Considerable local open-hearth material is still moving for export at higher than domestic quotations.

No. 1 heavy melting is off about 50 cents to $53, delivered, while No. 2 heavy meltnig is up 50 cents to $47, also No. 1 bundles and No. 1 busheling to $54. No. 2 bundles are a shade stronger at $44.50, delivered, and electric furnace bundles at $56-$57. Heavy turnings are lower at $49, delivered, and so are structurals and plate at $58-$59.

Mixed borings and turnings, short shoveling turnings and machine shop turnings are unchanged and larely nominal. Railroad specialties are steady. No. 1 cupola cast is off $1 to $47 on buying by a large pipe mill. Other cast iron grades are unchanged with malleable nominal.

New York—Scrap demand is light, with brokers reducing their buying prices on No. 2 bundles to $39-$40, on low phos structurals and plates to $53-$54. Brokers have lowered their buying prices on 18-8 stainless sheets, clips and solids to $280-$285, on 18-8 borings and turnings to $170-$180. Other grades are soft but unchanged.

Cleveland—Although active mill and foundry demand for scrap is lacking, the market undertone appears stronger. Largely, this is attributable to strength in bids for No. 1 factory bundles, which went up $3 to $4 at last month's close. For the most part, prices on the steelmaking grades are up about $1 a ton, but they are mostly nominal pending a buying test.

Buffalo—Scrap prices reflect a steady market undertone, despite the lack of mill buying. A small consumer bought a limited tonnage of No. 1 heavy melting at $2 above the recognized market, but the sale was not large enough to establish a new market level.

A test for the Buffalo area may come early this month when the leading local consumer re-enters the market. This mill was out of the market throughout July.

Dealers' accumulations last month were relatively light. There is no distress scrap overhanging the market.

Some foundries are buying limited tonnages of specialties.

Detroit—A scramble for small tonnage pushed up scrap prices in this area last week. No. 1 grades moved up following the advance the week earlier on the No. 2 grades. Turnings still hold on a low level. Machining operations are off. Increased die programs for the auto industry have sparked an advance in the foundry grades of scrap. More rises are expected.

Cincinnati—After a lull of several weeks, the scrap market here has developed a strong undertone; principal steelmaking grades moved up $1 a ton in brokers' buying prices. Area mills are expected to enter the market this week with brokers of the opinion that the bottom has been reached in steel production. No. 1 heavy melting is quoted $52-$53, brokers' buying price.

St. Louis—Railroad scrap has moved up $1 to $6 a ton under impetus of strong demand and

(*Please turn to page* 163)

Iron and Steel Scrap

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL, July 31, 1957. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

July 31	$54.50
July 24	54.00
July 1952	42.60
June Avg.	54.89
July 1956	47.70

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	*56.00-57.00*
No. 2 heavy melting	49.00-50.00
No. 1 factory bundles	*64.00-65.00*
No. 1 dealer bundles	56.00-57.00
No. 2 bundles	*47.00-48.00*
No. 1 busheling	56.00-57.00
Machine shop turnings	33.00-34.00
Mixed borings, turnings	33.00-34.00
Short shovel turnings	37.00-38.00
Cast iron borings	37.00-38.00
Cut Structurals:	
2 ft and under	*64.00-65.00*
3 ft lengths	*63.00-64.00*
Heavy turnings	*50.00-51.00*
Punchings & plate scrap	*63.00-64.00*
Electric furnace bundles	*63.00-64.00*

Cast Iron Grades

No. 1 cupola	49.00-50.00
Heavy breakable cast	47.00-48.00
Unstripped motor blocks	36.00-37.00
No. 1 machinery cast	59.00-60.00

Railroad Scrap

No. 1 R.R. heavy melt	64.00-65.00
Rails, 2 ft and under	75.00-76.00
Rails, 18 in. and under	76.00-77.00
Rails, random lengths	73.00-74.00
Railroad specialties	73.00-74.00

Stainless Steel Scrap

18-8 bundles & solids	300.00-315.00
18-8 turnings	190.00-215.00
430 bundles & solids	80.00-85.00
430 turnings	55.00-60.00

CLEVELAND

No. 1 heavy melting	*52.00-53.00*
No. 2 heavy melting	46.00-47.00
No. 1 factory bundles	*57.00-58.00*
No. 1 bundles	*52.00-53.00*
No. 2 bundles	43.00-44.00
No. 1 busheling	*52.00-53.00*
Machine shop turnings	*23.00-24.00*
Short shovel turnings	*27.00-28.00*
Mixed borings, turnings	*27.00-28.00*
Cast iron borings	*27.00-28.00*
Cut foundry steel	55.00-56.00
Cut structurals, plates 2 ft and under	*63.00-64.00*
Low phos. punchings & plate	*55.00-56.00*
Alloy free, short shovel turnings	*30.00-31.00*
Electric furnace bundles	*56.00-57.00*

Cast Iron Grades

No. 1 cupola	53.00-54.00
Charging box cast	43.00-44.00
Heavy breakable cast	41.00-42.00
Stove plate	50.00-51.00
Unstripped motor blocks	37.00-38.00
Brake shoes	41.00-42.00
Clean auto cast	54.00-55.00
Burnt cast	39.00-40.00
Drop broken machinery	56.00-57.00

Railroad Scrap

No. 1 R.R. heavy melt	57.00-58.00
R.R. malleable	61.00-62.00
Rails, 2 ft and under	75.00-76.00
Rails, 18 in. and under	76.00-77.00
Rails, random lengths	68.00-69.00
Cast steel	63.00-64.00
Railroad specialties	65.00-66.00
Uncut tires	63.00-64.00
Angles, splice bars	67.00-68.00
Rails, rerolling	73.00-74.00

Stainless Steel
(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	*300.00-305.00*
18-8 turnings	*200.00-205.00*
430 clips, bundles, solids	75.00-80.00
430 turnings	40.00-50.00

YOUNGSTOWN

No. 1 heavy melting	*55.00-56.00*
No. 2 heavy melting	*48.00-49.00*
No. 1 bundles	*55.00-56.00*
No. 2 bundles	*45.00-46.00*
No. 1 busheling	*55.00-56.00*
Machine shop turnings	*23.00-24.00*
Short shovel turnings	*29.00-30.00*
Cast iron borings	*29.00-30.00*
Low phos.	*60.00-61.00*
Electric furnace bundles	*60.00-61.00*

Railroad Scrap

No. 1 R.R. heavy melt.	63.00-64.00

CHICAGO

No. 1 heavy melt., indus.	*55.00-56.00*
No. 1 hvy melt., dealer	*52.00-53.00*
No. 2 heavy melting	*46.00-47.00*
No. 1 factory bundles	*59.00-60.00*
No. 1 dealer bundles	53.00-54.00
No. 2 bundles	*39.00-40.00*
No. 1 busheling, indus.	*55.00-56.00*
No. 1 busheling, dealer	*52.00-53.00*
Machine shop turnings	*34.00-35.00*
Mixed borings, turnings	*36.00-37.00*
Short shovel turnings	*36.00-37.00*
Cast iron borings	*36.00-37.00*
Cut structurals, 3 ft	58.00-59.00
Punchings & plate scrap	59.00-60.00

Cast Iron Grades

No. 1 cupola	47.00-48.00
Stove plate	45.00-46.00
Unstripped motor blocks	35.00-36.00
Clean auto cast	53.00-54.00
Drop broken machinery	53.00-54.00

Railroad Scrap

No. 1 R.R. heavy melt	*59.00-60.00*
R.R. malleable	62.00-63.00
Rails, 2 ft and under	79.00-80.00
Rails, 18 in. and under	80.00-81.00
Angles, splice bars	*69.00-70.00*
Rails, rerolling	79.00-80.00

Stainless Steel Scrap

18-8 bundles & solids	315.00-325.00
18-8 turnings	215.00-225.00
430 bundles & solids	*90.00-95.00*
430 turnings	*62.50-67.50*

DETROIT

(Brokers' buying prices.. f.o.b. shipping point)

No. 1 heavy melting	*50.00-51.00*
No. 2 heavy melting	42.00
No. 1 bundles	*50.00-51.00*
No. 2 bundles	41.00
No. 1 busheling	*50.00-51.00*
Machine shop turnings	27.00-28.00
Mixed borings, turnings	28.00-29.00
Short shovel turnings	29.00-30.00
Punchings & plate scrap	*60.00-61.00*

Cast Iron Grades

No. 1 cupola	*51.00*
Charging box cast	41.00
Stove plate	*44.00*
Heavy breakable	*39.00*
Unstripped motor blocks	28.00
Clean auto cast	*52.00*
Malleable	*53.00*

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	*46.00*
No. 2 heavy melting	43.00
No. 1 bundles	*48.00*
No. 2 bundles	38.00
No. 1 busheling	*46.00*
Machine shop turnings	30.00
Short shovel turnings	32.00

Cast Iron Grades

No. 1 cupola	48.00
Charging box cast	*42.00*
Heavy breakable cast	*42.00*
Unstripped motor blocks	40.00
Brake shoes	40.00
Clean auto cast	48.00
Stove plate	43.00

Railroad Scrap

No. 1 R.R. heavy melt.	57.00
Rails, 18 in. and under	*75.00*
Rails, random lengths	*68.00*
Rails, rerolling	*78.00*
Angles, splice bars	*63.00*

PHILADELPHIA

No. 1 heavy melting	*53.00*
No. 2 heavy melting	*47.00*
No. 1 bundles	*54.00*
No. 2 bundles	*44.50*
No. 1 busheling	*54.00*
Electric furnace bundles	*56.00-57.00*
Mixed borings, turnings	37.00
Short shovel turnings	38.00-39.00
Machine shop turnings	35.00-36.00
Heavy turnings	*49.00*
Structurals & plate	*58.00-59.00*
Couplers, springs, wheels	66.00
Rail crops, 2 ft & under	69.00-71.00

Cast Iron Grades

No. 1 cupola	*47.00*
Heavy breakable cast	53.00
Malleable	*62.00†*
Drop broken machinery	57.00

†Nominal

NEW YORK

(Brokers' buying prices)

No. 2 heavy melting	51.00-52.00
No. 2 heavy melting	41.00-42.00
No. 1 bundles	51.00-52.00
No. 2 bundles	*39.00-40.00*
Machine shop turnings	26.00-27.00
Mixed borings, turning	27.00-28.00
Short shovel turnings	29.00-30.00
Low phos. (structural & plate	*53.00-54.00*

Cast Iron Grades

No. 1 cupola	46.00-47.00
Unstripped motor blocks	39.00-40.00
Heavy breakable	46.00-47.00

Stainless Steel

18-8 sheets, clips, solids	*280.00-285.00*
18-8 borings, turnings	*170.00-180.00*
430 sheets, clips, solids	60.00-70.00
410 sheets, clips, solids	50.00-55.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*42.00-43.00*
No. 2 heavy melting	35.00-36.00
No. 1 bundles	*42.00-43.00*
No. 2 bundles	33.00-34.00
No. 1 busheling	42.00-43.00
Machine shop turnings	24.00-25.00
Mixed borings, turnings	27.00-28.00
Short shovel turnings	28.00-29.00
No. 1 cast	34.00-35.00
Mixed cupola cast	33.00-34.00
No. 1 machinery cast	42.00-43.00

BUFFALO

No. 1 heavy melting	46.00-47.00
No. 2 heavy melting	39.00-40.00
No. 1 bundles	46.00-47.00
No. 2 bundles	36.00-37.00
No. 1 busheling	46.00-47.00
Mixed borings, turnings	35.00-36.00
Machine shop turnings	*31.00-32.00*
Short shovel turnings	36.00-37.00
Cast iron borings	35.00-36.00
Low phos.	53.00-54.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	47.00-48.00
No. 1 machinery	52.00-53.00

Railroad Scrap

Rails, random lengths	61.00-62.00
Rails, 3 ft and under	66.00-67.00
Railroad specialties	59.00-60.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*52.00-53.00*
No. 2 heavy melting	*45.00-46.00*
No. 1 bundles	*52.00-53.00*
No. 2 bundles	*43.00-44.00*
No. 1 busheling	*52.00-53.00*
Machine shop turnings	*33.00-34.00*
Mixed borings, turnings	30.00-31.00
Short shovel turnings	*36.00-37.00*
Cast iron borings	30.00-31.00
Low phos. 18 in.	*59.00-60.00*

Cast Iron Grades

No. 1 cupola	45.00-46.00
Heavy breakable cast	42.00-43.00
Charging box cast	42.00-43.00
Drop broken machinery	55.00-56.00

Railroad Scrap

No. 1 R.R. heavy melt.	*56.00-57.00*
Rails, 18 in. and under	*71.00-72.00*
Rails, random lengths	*64.00-65.00*

BIRMINGHAM

No. 1 heavy melting	49.00-50.00
No. 2 heavy melting	39.00-40.00
No. 1 bundles	49.00-50.00
No. 2 bundles	37.00-38.00
No. 1 busheling	49.00-50.00
Cast iron borings	28.00-29.00
Short shovel turnings	37.50-38.50
Machine shop turnings	36.50-37.50
Bar crops and plates	55.00-56.00
Structurals & plate	55.00-56.00
Electric furnace bundles	51.00-52.00
Electric furnace:	
3 ft and under	49.00-50.00
2 ft and under	48.00-49.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	*54.00-55.00*
Stove plate	*54.00-55.00*
Unstripped motor blocks	44.00-45.00
Charging box cast	*37.00-38.00*
No. 1 wheels	46.00-47.00

Railroad Scrap

No. 1 R.R. heavy melt.	55.00-56.00
Rails, 18 in. and under	*66.00-67.00*
Rails, rerolling	75.00-76.00
Rails, random lengths	*60.00-61.00*
Angles, splice bars	60.00-61.00

SEATTLE

No. 1 heavy melting	49.00
No. 2 heavy melting	44.00
No. 1 bundles	44.00
No. 2 bundles	32.00
Machine shop turnings	29.00
Mixed borings, turnings	29.00
Electric furnace No. 1	55.00

Cast Iron Grades

No. 1 cupola	45.00
Heavy breakable cast	37.00
Unstripped motor blocks	32.50
Stove plate (f.o.b. plant)	30.00

LOS ANGELES

No. 1 heavy melting	46.00
No. 2 heavy melting	43.00
No. 1 bundles	45.00
No. 2 bundles	38.00
Machine shop turnings	32.00
Shoveling turnings	34.00
Cast iron borings	32.00
Cut structural and plate, 1 ft and under	61.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	53.00

Railroad Scrap

No. 1 R.R. heavy melt.	46.00

SAN FRANCISCO

No. 1 heavy melting	48.00
No. 2 heavy melting	46.00
No. 1 bundles	47.00
No. 2 bundles	35.00
Machine shop turnings	32.00
Mixed borings, turnings	32.00
Cast iron borings	32.00
Heavy turnings	32.00
Short shovel turnings	34.00
Cut structurals, 3 ft	56.00

Cast Iron Grades

No. 1 cupola	53.00
Charging box cast	45.00-47.00
Stove plate	46.00
Heavy breakable cast	40.00
Unstripped motor blocks	48.00
Clean auto cast	55.00
No. 1 wheels	48.00
Drop broken machinery	53.00

HAMILTON, ONT.

No. 1 heavy melting	43.00
No. 2 heavy melting	38.00
No. 1 bundles	43.00
No. 2 bundles	32.00
Mixed steel scrap	35.00
Mixed borings, turnings	19.00
Busheling, new factory:	
Prepared	43.00
Unprepared	37.00
Short steel turnings	30.00
Rails, rerolling	49.00

Cast Iron Grades†

No. 1 machinery cast	50.00

†F.o.b. Hamilton, Ont.

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President, E. I. du Pont de Nemours & Co., Inc.

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STEEL
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Aluminum Prices Advance

Alcoa adds 1 cent to the price of pig, about 4 per cent to mill products. Imports still hurt zinc, with little hope for immediate congressional action. Copper dull

Nonferrous Metal Prices, Pages 162 & 163

ALUMINUM PIG now costs 26 cents a pound.

As expected, on Aug. 1 prices on pig were advanced 1 cent a pound and about 4 per cent on alloys and mill products (see STEEL, July 29, p. 188; July 8, p. 152).

Aluminum Co. of America was the first to announce (July 29). Alcoa listed as reasons for the jump: 1. An automatic wage hike for hourly workers that went into effect on Aug. 1. 2. Increased salaries and benefits for white-collar employees. 3. Rising costs of materials, transportation and services.

Independent fabricators will probably pass the 4 per cent increase along to their customers. Reason: Most feel their own rising costs will not allow them to absorb the boost. One eastern fabricator says his company will pass on only the increased cost of aluminum—other expenses will be absorbed.

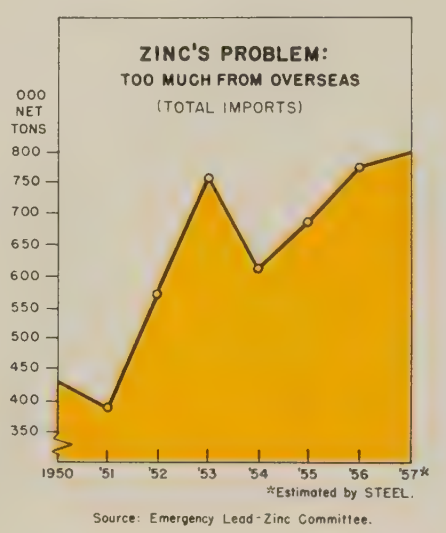
More Aluminum—Reynolds Metals Co. has opened a $5.5-million fabricating plant in Richmond, Va. Potential production is pegged at 2 million lb a month. Facilities include: Four, 2300-ton extrusion presses, casting equipment and a die manufacturing machine shop.

Zinc: Little Action

Some producers report a slight pickup in new orders during the past week, but the industry's cash registers aren't too busy.

The production curtailment trend continues. New Jersey Zinc Co. announced it will stop ore production at its Sterling Hill mine, Ogdensburg, N. J., on Aug. 16. This will take an additional 1800 tons a month off the market. (Unofficial estimates peg domestic mine and smelter cutbacks since Jan. 1 at about 13,000 tons monthly.) Some observers say domestic production will have to be slashed even more before the price of 10 cents a pound is stabilized.

Producers hope the hearings being conducted by the House



Source: Emergency Lead-Zinc Committee.

Ways & Means committee will result in legislation to stop the flood of foreign imports (see chart). But most feel that even though such a bill would probably receive warm support in the Senate, it won't be proposed this session.

Office of Defense Mobilization has given the General Services Administration authority to buy lead and zinc on a month-to-month basis through June as part of the government's strategic stockpile program. But it remains to be seen whether GSA will purchase any metal.

Copper: Sales Spotty

Currently, the copper picture is dull. Foreign sales are still good, but there's only hand-to-mouth buying on the domestic scene. By late August or early September producers hope for an order upswing from brass mills. It's still felt that the fourth quarter will bring a revival in copper sales.

The strike at Northern Rhodesian mines has ended, killing hopes that lost production might firm the red metal's price.

Titanium Reschedules

While titanium capacity grows, orders from the metal's biggest customer, the aircraft industry, are slacking off. The Air Force is stretching out orders, forcing the industry to reschedule shipments. Probability: More production will go into missiles and civilian uses. Look for about 8500 tons of mill products this year.

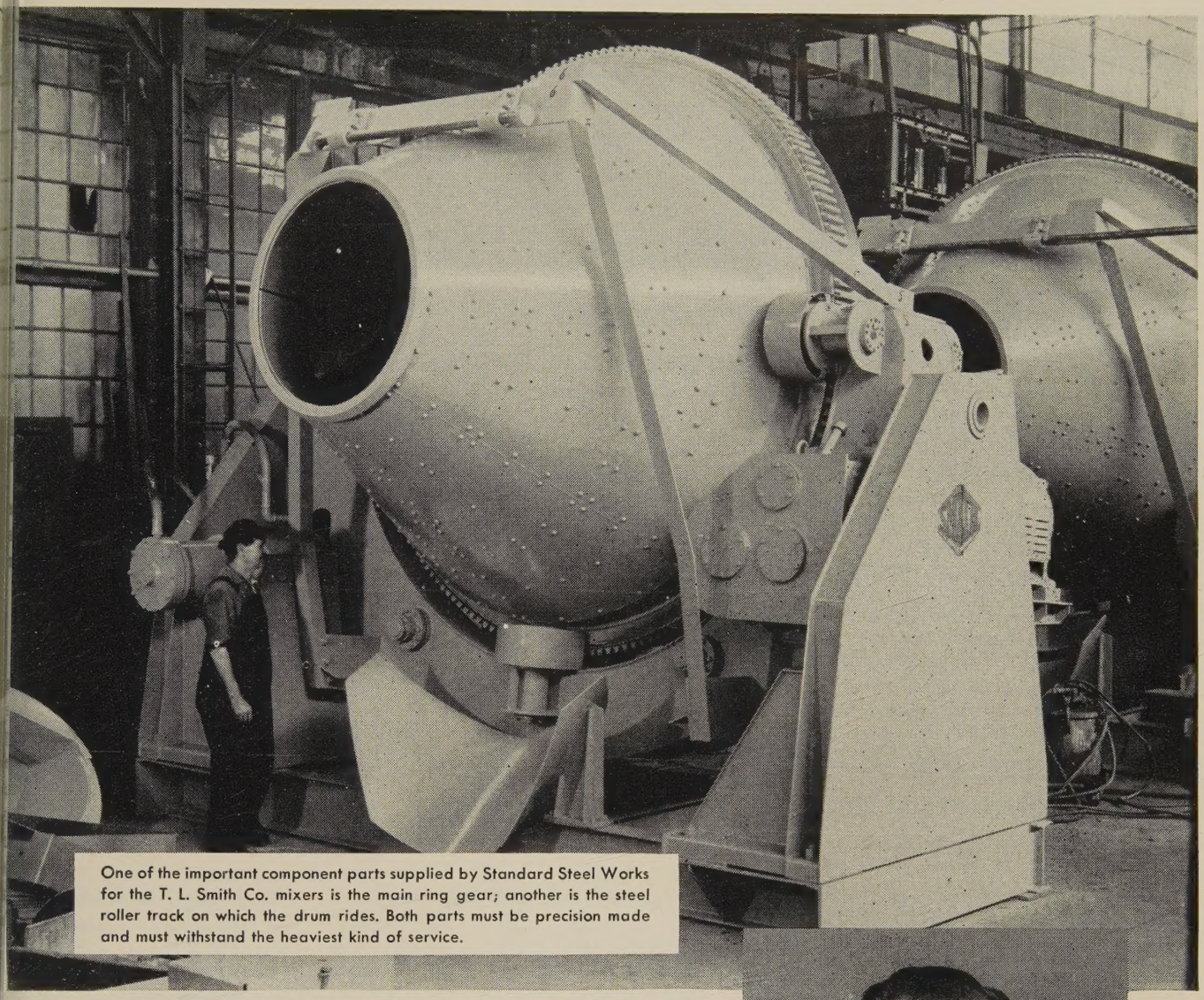
Market Memo

• Second quarter earnings of St. Joseph Lead Co. will probably exceed the $1.01 a share reported for the March quarter. Reasons: 1. A dividend of $1,075,000 from the firm's Argentina mining subsidiary. 2. Bartering of foreign origin lead and zinc to the U.S. for surplus agricultural products.

NONFERROUS PRICE RECORD

	Price July 31	Last Change	Previous Price	July Avg	June Avg	Aug., 1956 Avg
Aluminum ..	27.10	Aug. 10, 1956	25.90	27.100	27.100	26.700
Copper	28.25–29.25	July 19, 1957	28.50–29.25	28.822	30.250	39.750
Lead	13.80	June 11, 1957	14.80	13.800	14.120	15.800
Magnesium .	35.25	Aug. 13, 1956	33.75	35.250	35.250	34.694
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	64.500
Tin	95.625	July 31, 1957	95.875	96.576	98.080	99.043
Zinc	10.00	July 1, 1957	10.50	10.000	10.840	13.500

Quotations in cents per pound based on: COPPER, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary ingots, 99 + %, deld.; MAGNESIUM, pig, 99.8%, Velasco, Tex.

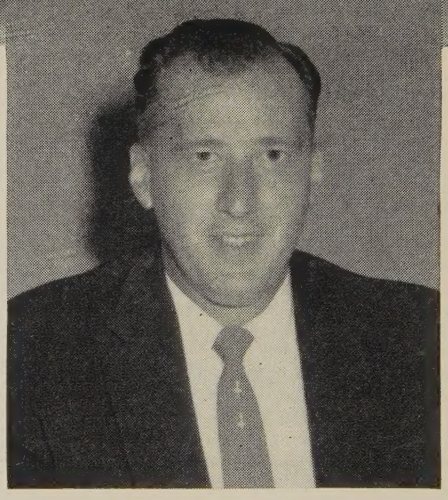


One of the important component parts supplied by Standard Steel Works for the T. L. Smith Co. mixers is the main ring gear; another is the steel roller track on which the drum rides. Both parts must be precision made and must withstand the heaviest kind of service.

"The T. L. Smith Co. is constantly seeking design improvements and production economies. Standard Steel Works has proved a big help to us in both respects."

As suppliers of component parts to the T. L. Smith Co.—world's oldest and largest manufacturer of concrete mixers—we have made it *our* business to get to know *their* business well enough to consider ourselves a part of their team.

It is our policy to work in the closest possible cooperation with all of our customers to assure maximum quality at lowest possible cost. Let us discuss your casting and forging needs with you. You'll find that service to our customers is as important as the quality of the products we make. Write Dept. 2-H.



"We are particularly impressed with Standard's methods-people and the way their engineers so effectively supplement our own in constantly suggesting design improvements and production economies," says R. R. Kupfer, purchasing agent for the T. L. Smith Co., Milwaukee, Wis.

Standard Steel Works Division

BALDWIN · LIMA · HAMILTON

BURNHAM, PENNSYLVANIA

Rings • Shafts • Car wheels • Gear blanks • Flanges • Special shapes

BALDWIN BLH LIMA-HAMILTON

Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99+%, ingots, 28.10; pigs, 26.00, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 28.90; No. 43, 28.70; No. 195, 30.30; No. 241, 30.50; No. 356, 28.90, 30-lb ingots.

Antimony: R.M.M. brand, 99.5%, 33.00; Lone Star brand, 33.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.50-28.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.25% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb deld.

Cobalt: 97-99%, $2.00 per lb for 550-lb keg; $2.02 per lb for 100-lb case; $2.07 per lb under 100 lb.

Columbium: Powder, $120 per lb, nom.

Copper: Electrolytic, 29.25 deld. Conn. valley; 29.25 deld. Midwest; custom smelters, 28.25; lake, 29.25 deld.; fire refined, 29.00 deld.

Germanium: First reduction, $179.17-197.31 per lb; intrinsic grade, $197.31-220 per lb, depending on quantity.

Gold: U.S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $90-110 nom. per troy oz.

Lead: Common, 13.80; chemical, 13.90; corroding, 13.90, St. Louis, New York basis, add 0.20.

Lithium: 98+%, cups or ingots, $11.50; rod, $13.50; shot or wire, $14.50, f.o.b. Minneapolis, 100 lb lots.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 13 in. sticks, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91B (die casting), 37.25 deld.; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $255-257 per 76-lb flask.

Molybdenum: Extruded ingot, $9.60 per pound, f.o.b. Detroit.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for addition to cast iron, 74.50; "F" nickel 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01. Nickel oxide sinter, 71.25 per lb of nickel content before 1 cent freight allowance, f.o.b. Copper Cliff, Ont.

Osmium: $80-100 per troy oz, nom.

Palladium: $21-21.50 per troy oz.

Platinum: $84-87 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $120-125 per troy oz.

Ruthenium: $50-55 per troy oz.

Selenium: $10.50 per lb, commercial grade.

Silver: Open market, 90.25 per troy oz.

Sodium: 16.50, c.l.; 17.00 l.c.l.

Tantalum: Rod, $60 per lb; sheet, $55. per lb.

Tellurium: $1.65-1.85 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N.Y., spot, 95.625; prompt, 95.625.

Titanium: Sponge, 99.3+%, grade A-1 ductile (0.3% Fe max.), $2.25; grade A-2 (0.5% Fe max.), $2.00 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $3.75 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99+% hydrogen reduced, $4.50.

Zinc: Prime Western, 10.00; brass special, 10.25; intermediate, 10.50, East St. Louis, freight allowed over 0.50 per lb. New York basis, add 0.50. High grade, 11.35; special high grade, 11.75 deld. Die casting alloy ingot No. 3, 14.25; No. 2, 15.25; No. 5, 14.75 deld.

Zirconium: Sponge, commercial grade, $5-10 per lb.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 24.25-29.50; No. 12 foundry alloy (No. 2 grade), 22.75-24.25; 5% silicon alloy, 0.60 Cu max., 26.00-26.50; 13 alloy, 0.60 Cu max., 26.00-26.50; 195 alloy, 25.75-27.25; 108 alloy, 23.25-24.25. Steel deoxidizing grades, notch bars, granulated or shot; Grade 1, 24.50; grade 2, 22.75; grade 3, 21.75; grade 4, 20.75.

Brass Ingot: Red brass, No. 115, 29.50; tin bronze, No. 225, 39.00; No. 245, 33.50; high-leaded tin bronze, No. 305, 33.50; No. 1 yellow, No. 405, 24.00; manganese bronze, No. 421, 27.00.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 37.50; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.80, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.77, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 30,000-lb lots, 34.605; l.c.l., 35.23. Weatherproof, 30,000-lb lots, 35.72; l.c.l., 36.47. Magnet wire deld., 15,000 lb or more, 41.93; l.c.l., 42.68.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $19.50 per cwt; pipe, full coils, $19.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheets and strip, $9.50-15.95; sheared mill plate, $8.00-11.50; wire, $7.50-11.50; forging billets, $6.00-7.60; hot-rolled and forged bars, $6.15-7.90.

ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, 24.00; ribbon zinc in coils, 20.50; plates, 19.00.

ZIRCONIUM

Plate, $12.50-19.20; H.R. strip, $12.50-22.90; C.R. strip, $15.00-31.25; forged or H.R. bars, $11.00-17.40.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	126	106	128
Strip, C.R.	124	108	138
Plate, H.R.	120	105	121
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheets and Circles: 1100 and 3003 mill finish (30,000 lb base; freight allowed).

Thickness Range Inches	Flat Sheet	Coiled Sheet
0.249-0.138	40.90-45.40	....
0.135-0.096	41.40-46.50	37.70-39.60
0.095-0.077	42.10-48.30	37.80-39.80
0.076-0.061	42.70-50.60	38.20-40.50
0.060-0.048	43.40-52.90	38.80-41.50
0.047-0.038	43.90-55.60	38.60-42.90
0.037-0.030	44.30-50.00	40.40-44.70
0.029-0.024	44.90-52.40	41.00
0.023-0.019	45.80-52.20	42.00
0.018-0.017	46.50-53.30	42.60
0.016-0.015	47.50-53.90	43.40
0.014	48.50-50.90	44.40
0.013-0.012	49.70-52.10	45.10
0.011	50.70-53.70	46.30
0.010-0.0095	52.10-54.40	47.60
0.009-0.0085	53.40	49.10
0.008-0.0075	55.00	50.30
0.007	56.50	51.80
0.006	58.10	53.20

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	42.70	40.75
5050-F	43.80	48.60
3004-F	44.80	50.50
5052-F	45.40	51.20
6061-T6	46.40	53.00
2024-T4*	50.60	57.40
7075-T6*	58.40	66.00

*24-48 in. width or diam., 72-180 lengths.

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or across flats	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
Drawn				
0.125	78.20	75.20	....	....
0.156-0.172	66.20	63.40	....	....
0.188	66.20	63.40	....	81.60
0.219-0.234	63.00	61.50	....	....
0.250-0.281	63.00	61.50	....	77.90
0.313	63.00	61.50	....	74.20
0.344	81.60	....	....	....
Cold-Finished				
0.375-0.547	62.50	61.30	74.80	69.80
0.563-0.688	62.50	61.30	71.11	65.50
0.750-1.000	61.00	59.70	64.90	61.70
1.063	61.00	59.70	....	59.60
Rolled				
1.125-1.500	58.60	57.40	62.80	59.60
1.563	57.00	55.70	....	....
1.625-2.000	56.30	54.90	....	....
2.125-2.500	54.80	53.40	....	....
2.563-3.375	53.20	51.70	....	....

Forging Stock: Round, Class 1, 43.30-55.90 in specific lengths, 36-144 in., diam. 0.375-8 in. Rectangles and squares, Class 1, 48.10-63.20 in random lengths, 0.375-4 in. thick, width 0.0750-10 in.

Pipe: ASA schedule 40, alloy 6063-T6, standard lengths, plain ends, 90,000-lb base, per 100 ft.

Nom. Pipe Size (in.)		Nom. Pipe Size (in.)	
¾	$18.75	2	$ 57.00
1	29.00	4	157.20
1¼	39.25	6	281.65
1½	46.95	8	423.80

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	43.10-44.60	57.80-61.80
12-14	43.40-44.80	58.40-62.70
15-17	43.60-45.40	59.60-64.30
18-20	44.10-45.80	61.50-66.80

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grade, .032 in., 171.30; .081 in., 108.70; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Thread plate, .188 in., 71.70; .250-2.00 in., 70.60. Tooling plates, .250-3.0 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	69.60-72.40	84.60-87.40
12-14	70.70-73.00	85.70-88.00
24-26	75.60-76.30	90.60-91.30
36-38	89.20-90.30	104.20-105.30

NONFERROUS SCRAP

DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots.)

Aluminum: 1100 clippings, 13.00-13.50; old sheets, 10.00-10.50; borings and turnings, 6.50-

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tubes	Clean Heavy	Rod Ends	Clean Turnings
Copper	51.38b	48.61c	....	51.57	25.250	25.250	24.500
Yellow Brass	44.69	32.87d	45.23	47.60	19.125	18.875	17.375
Low Brass, 80%	47.40	47.34	47.94	50.21	21.375	21.125	20.625
Red Brass, 85%	48.36	48.30	48.90	51.17	22.250	22.000	21.500
Com. Bronze, 90%	49.86	49.80	50.40	52.42	23.125	22.875	22.375
Manganese Bronze	52.52	46.69	57.19	....	17.625	17.375	16.875
Muntz Metal	46.94	42.75	....	....	17.875	17.625	17.125
Naval Brass	48.85	43.16	55.91	52.26	17.625	17.375	16.875
Silicon Bronze	55.96	55.15	56.00	57.97e	24.750	24.500	24.750
Nickel Silver, 10%	61.52	63.85g	63.85	....	25.750	25.000	12.875
Phos. Bronze, A-5%	70.47	70.97	70.97	72.15	26.250	26.000	25.000

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded

0; crankcases, 10.00-10.50; industrial cast-s, 10.00-10.50.

pper and Brass: No. 1 heavy copper and re, 21.00-21.50; No. 2 heavy copper and wire, 50-20.00; light copper, 17.00-17.50; No. 1 mposition red brass, 18.50-19.00; No. 1 com-sition turnings, 18.00-18.50; yellow brass rnings, 10.75-11.25; new brass clippings, 00-17.50; light brass, 10.50-11.00; heavy llow brass, 12.50-13.00; new brass rod ends, 50-15.00; auto radiators, unsweated, 13.50-00; cocks and faucets, 14.50-15.00; brass e, 15.50-16.00.

ad: Heavy 9.50-10.00; battery plates, 25-4.50; linotype and stereotype, 11.50-12.00; ctrotype, 10.00-10.50; mixed babbitt, 11.00-50.

onel: Clippings, 45.00-53.00; old sheets, 00-53.00; turnings, 35.00-43.00; rods, 45.00-00.

ckel: Sheets and clips, 85.00-90.00; rolled odes, 85.00-90.00; turnings, 70.00-75.00; d ends, 85.00-90.00.

nc: Old Zinc, 1.75-2.25; new die-cast scrap, 50-3.50; old die-cast scrap, 1.75-2.25.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

uminum: 1100 clippings, 17.75-18.75; 3003 ppings, 17.75-18.75; 6151 clippings, 17.50-75; 5052 clippings, 17.50-18.25; 2014 clip-ngs, 17.00-18.25; 2017 clippings, 17.00-18.25; 24 clippings, 17.00-18.25; mixed clippings, 25-17.25; old sheets, 14.25-15.25; old cast, 25-15.25; clean old cable (free of steel), 50-18.75; borings and turnings, 15.00-16.75.

ryllium Copper: Heavy scrap, 0.020-in. and avier, not less than 1.5% Be, 51.00; light rap, 46.00; turnings and borings, 31.00.

pper and Brass: No. 1 heavy copper and re 24.75; No. 2 heavy copper and wire, 50; light copper, 20.25; refinery brass 0% copper) per dry copper content, 22.125.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

pper and Brass: No. 1 heavy copper and re, 24.75; No. 2 heavy copper and wire, 50; light copper, 20.25; No. 1 composition rings, 21.00; No. 1 composition solids, 21.50; avy yellow brass solids, 15.50; yellow brass rnings, 14.50; radiators, 17.00.

PLATING MATERIALS

(f.o.b. shipping point, freight allowed on antities)

ANODES

dmium: Special or patented shapes, $1.70 r lb.

pper: Flat-rolled, 47.54; oval, 45.75, 5000-0,000 lb; electrodeposited, 39.50, 2000-5000 lots; cast, 41.00, 5000-10,000 quantities.

ckel: Depolarized, less than 100 lb, 101.50; 0-499 lb, 99.50; 500-4999 lb, 95.50; 5000-999 lb, 93.50; 30,000 lb, 91.50. Carbonized, duct 3 cents a lb.

n: Bar or slab; less than 200 lb, 114.50; 200-9 lb, 113.00; 500-999 lb, 112.50; 1000 lb or ore, 112.00.

nc: Balls, 17.50; flat tops, 17.50; flats, 25; ovals, 18.50, ton lots.

CHEMICALS

dmium Oxide: $1.70 per lb in 100-lb drums.

romic Acid: 100 lb, 33.30; 500 lb, 32.80; 00 lb, 32.15; 5000 lb, 31.80; 10,000 lb, 31.30, o.b. Detroit.

pper Cyanide: 100-200 lb, 74.80; 300-900 , 72.80.

pper Sulphate: 100-1900 lb, 15.20; 2000-5900 , 13.20; 6000-11,900 lb, 12.95; 12,000-22,900 , 12.70; 23,000 lb or more, 12.20.

ckel Chloride: 100 lb, 48.50; 200 lb, 46.50; 0 lb, 45.50; 400 lb, 43.50; 5000 lb, 41.50; ,000 lb, 40.50.

ckel Sulphate: 100 lb, 40.50; 200 lb, 38.50; 0 lb, 37.50; 400-4900 lb, 35.50; 5000-29,900 , 33.50; 30,000 lb or more, 32.50.

dium Cyanide: 100 lb, 27.50; 200 lb, 25.80; 0 lb, 22.80; 1000 lb, 21.80; f.o.b. Detroit.

dium Stannate: Less than 100 lb, 76.30; 100-0 lb, 67.20; 700-1900 lb, 64.50; 2000-9900 lb, .60; 10,000 lb or more, 61.30.

annous Chloride (anhydrous): Less than 25 , 165.90; 25 lb, 130.90; 100 lb, 115.90; 400 lb, 3.50; 5200-19,600 lb, 101.30; 20,000 lb or ore, 89.10.

annous Sulphate: Less than 50 lb, 128.70; 50 , 98.70; 100-1900 lb, 96.70; 2000 lb or ore, 94.70.

nc Cyanide: 100-200 lb, 59.00; 300-900 lb, .00.

(*Concluded from page* 157)

short supply. Rail offerings have been running light. Heavy breakable cast and unstripped motor blocks are up $2 because of unusual demand from outside districts. Melting steel grades are unchanged, except for minor equalizations with other areas. The market undertone continues strong, but mill bookings are small and selective.

Birmingham — Although scrap consumers have limited their buying for several weeks in an effort to discourage a further price rise, their action has had little effect on the market. One large cast buyer last week bought No. 1 cupola and stove plate at advances of $1 a ton.

The largest open-hearth steel buyer in the district continues out of the market. Electric furnace material prices are steady. Exporters now are quoting prices to draw scrap from nearby points, but they are not pushing inland.

San Francisco — There is little movement currently in the local

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Help Wanted

WANTED ENGINEERS, DRAFTSMEN, AND layouts. One of the leading structural steel and plate fabricating companies in Florida (located in Central Florida). Ideal working conditions; air conditioned office, co-benefits, insurance, hospitalization, vacation, and holidays. Write Box 574, STEEL, Penton Bldg., Cleveland 13, Ohio.

Positions Wanted

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steel scrap market. The mills hold substantial inventories.

Los Angeles—Scrap prices are unchanged in this market. Some dealers say mills' offering quotations are $1 to $2 under what tonnage will bring in actual sales.

Pig Iron . . .

Pig Iron Prices, Page 152

Merchant pig iron buying is taking a more decided turn upward. Adverse seasonal influences will continue throughout this month, but most foundry suspensions for mass vacations are over, and the improvement in operations will shortly give rise to a demand for iron.

The smaller of the Alan Wood Steel Co.'s blast furnaces at Swedeland, Pa., which has been down several weeks for repairs and enlargement, has been relighted.

Iron Ore . . .

Iron Ore Prices, Page 153

Stocks of iron ore and ore agglomerates on hand on the last day of June totaled 41,201,237 gross tons, reports the American Iron Ore Association.

Breakdown: U.S. Lake Superior ores, 28,409,328 tons, against 29,965,742 a year ago; other U.S. ores, 3,317,500, against 2,620,610; Canadian Lake Superior ores, 1,160,454, against 869,281; other Canadian ores, 3,184,939, against 2,320,856; foreign ores (except Canada) 5,129,016, against 3,708,163.

Consumption during June amounted to 10,973,013 tons, against 10,575,249 in the like month of 1956. Breakdown: U.S. Lake Superior ores, 6,611,090 tons, against 6,911,684 a year ago; other U.S. ores, 1,708,945, against 1,419,974; Canadian Lake Superior ores, 320,146, against 282,554; other Canadian ores, 843,697, against 723,127; foreign ores (other than Canadian), 1,489,135, against 1,237,910 tons.

Shipments of Lake Superior iron ore in the seven-day period ended July 29 totaled 3,164,408 gross tons.

Cumulative movement of ore in the 1957 shipping season to July 29 was reported at 43,265,048 tons, up 9,527,673 tons from the 33,737,375 shipped in the 1956 period.